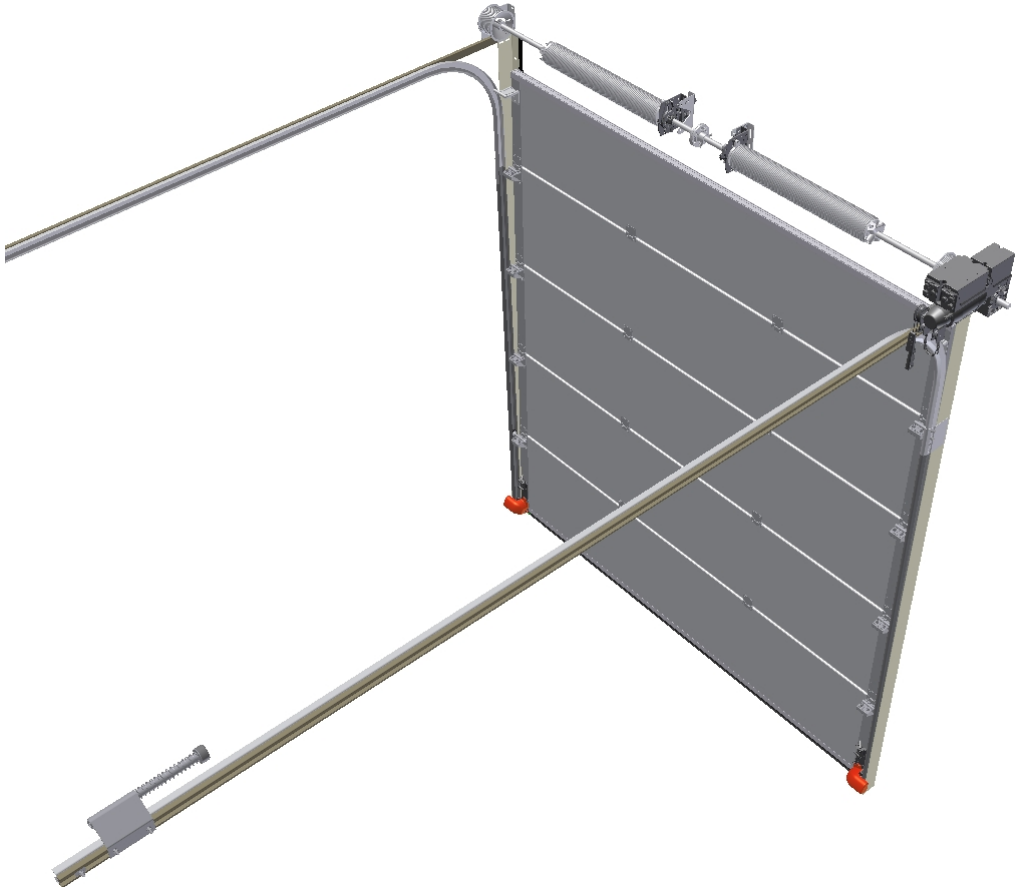
door-solutions



Installation Manual

for industrial sectional doors with torsion springs

EN

TÜV NORD CERT

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1. Symbols and/or warning signs.

General DANGER !! symbol
ATTENTION !! symbol
Carefully read the text when you see this symbol !!

Symbol : Risk of personal injury!!
Carefully read the text when you see this symbol !!

2. General

This Installation Manual was written specifically for use by qualified personnel and is therefore not suitable for apprentices or 'DIY-ers'.
If anything regarding installation and/or maintenance is not clear, please contact DOCO International.

To prevent serious personal injury, all directions and instructions in this manual should be carefully read and observed.

- This manual describes the installation of industrial fitting sets with torsion springs, but it may be necessary to consult other installation manuals such as the one for the drive (if fitted).
- Your fitting set is designed in accordance with the latest European standards, however you should check whether it complies with your local national standards.
- Adding or removing parts may have an adverse effect on the operation and thus the safety of the final sectional gate.
- All indications regarding right/left installation are seen from the place of installation, i.e. from the inside looking out!
- Unless stated otherwise, all measurements are in millimetres.
- After installation, check whether the CE mark has been affixed and completed.
- This manual should be carefully stored.
- We reserve the right to modify specifications without written notice.

2.1 Safety requirements regarding installation and use

- The garage gate may only be installed, connected and commisioned by skilled personnel.
- When working on the electrics, always ensure the power is and remains isolated!
- Never bypass safety features!
- Some parts have sharp edges - use safety gloves.
- Never operate the sectional gate if you see that the safety features are damaged.
- During installation / maintenance of the garage gate, wear at least gloves, safety shoes and, when drilling, safety goggles!
- Always ensure a stable footing when working.
- Secure the installation / maintenance site using appropriate safety devices to keep others (children) at distance.
- Maintenance should only be performed by a specialist firm and/or qualified personnel.
- Provide adequate lighting.
- Only use suitable tools, especially for tensioning torsion springs.

3. Directives and standards

The following directives and standards were used during the design, production and installation of these tracks.

98/79/EEC	**Machine Directive**
89/106/EEC	**Construction Equipment Directive**
89/336/EEC	**EMC Directive**
2006/95/EG	**Low Voltage Directive**
EN 12604:2000	Mechanical aspects; requirements and classification
EN 12605:2000	Mechanical aspects; testing methods
EN 12445:2000	Safety for powered gates; testing methods
EN 12453:2000	Safety for powered gates, requirements
EN 13241-1:2003	Door and gate product standard

3.1 Warranty and liability

Unprofessional installation, unauthorized alterations (other parts) to the sectional gate or alterations to the drive that are not in compliance with this manual will invalidate the warranty and thus will release the manufacturers from any liability.
This also includes damage resulting from incorrect operation, failure to follow the instructions in this manual and/or poor maintenance and/or care.

4 Installation

4.1 Application

DOCO International have developed fitting sets designed for installation in industrial entrances/exits to be used safely for vehicles and/or people.*
These sets contain the following features:

- Steel fitting sets with front torsion springs, fully balanced.
- Compliance with the CE standard provided only DOCO International parts are used (unless stated otherwise).

* If the gate is switched to automatic or remote control, extra measures need to be taken to guarantee safety! See paragraph 4.16.3.c) *Control: Automatic operation or via remote*.

4.1.1 Specifications

Standard lift:
7.5m max. width
Height: 9.8m max.
Door surface: 36m2 max.
Weight: 600kg max.
Installation area: see system diagram

High lift:
7.5m max. width
Height: 9.9m max.
High lift: 4.15m max.
Door surface: 36m2 max.
Weight: 600kg max.
Installation area: see system diagram

Vertical fitting:
7.5m max. width
Height: 8.4m max.
Door surface: 36m2 max.
Weight: 600kg max.
Installation area: see system diagram

EN 13241-1 classification: see appendix 5

This manual describes the installation of a sectional door using only DOCO International parts. The installation of parts not specified or other parts not described in this manual is the responsibility of the end producers of the garage port. They are also responsible for the correct CE certification of the sectional door.

DOCO International has had the “product testing” of these fitting sets carried out by the TÜV Nord-cert institute in Germany, registered as Notified Body No. 0032.
Documents of this “product testing” may be requested from DOCO.

This “product testing” does NOT include any access door. If you DO install an access door, additional “product testing” is needed. This is the responsibility of the garage door manufacturer.

4.2 Scope of supply

The fitting set supplied by us includes the following parts, the details of which depend on the door dimensions and the type of lifting system.

Track set:

- Vertical track set assembled	part 21xxx + 2369X (2x) + 25240 (2x) (4x)
- Horizontal track set assembled	part 22xx0 (1pr)+ 248xx (2x)
- Side seals	part 2274x

Power unit and bearing plates:

- Side bearing plates	part 1300x
- Shaft	part 25016-xx
- Cable drums	depends on various (See 4.10.11)
- Steel cables	part 25110-xx 4mm < 295kg
	part 25111-xx 5mm < 463kg
	part 25112-xx 6mm < 600kg
- Spring break protection devices	part 25449 (2x)(4x) + 25448 (2x)(4x)
- Coupling	part 25042
Assembled torsion springs	via “DOOR PROCESSING” computer programme

See 4.10.8

Hardware and panel related products:

- Cable break protection (base console)	part 25453(a) < 450kg
	part 25450 < 600kg
- Side hinges	panel dependent (see appendix 4)
- Centre hinges	panel dependent (see appendix 4)
- End covers	panel dependent (see appendix 4)
- Stiffening profiles	part 24701-xx (gate width >5000mm)
- Rollers	depends on gate size (see 4.12.2)
- Aluminium bottom profile	part 80041
- Aluminium top profile	part 80041
- Bottom seal	part 80045
- Top seal	part 2274x
- Spring buffers	part 25330 (2x) + 25341 (2x)
- Self-tapping screw without drill head	part 14017
- Self-tapping screw with drill head	part 14027
- Lintel seal profile	part 24710 + 2474x

Optional extras:

- Lock	part 25226
- Handle	part 25093
- Chain hoist	part 25025
- Drop down profiles	depends on gate size (see 4.8)

Drive and control unit:

- GFA	depends on various (4.16.3)

Closing side sensors :

- Fraba set	fraba part OSE – S 1101
- Fraba end stop set	fraba part OSE-D-B 55/8

4.3 Installation tools

Here is a minimum list of the necessary tools:

- Level (hose)
- Drill
- Battery - drill
- Jigsaw
- Tensioning rods
- Flexible steel rule
- Ratchet and cover 10mm / 13mm
- Ring/open-ended spanner: 10 – 11mm / 12 – 13mm
- Gripper: 2x
- Blind rivet pliers
- Rope
- Ladder or scaffolding / cherry picker
- Iron file
- Allen keys
- Drill bits: Ø9 , Ø10
- Working gloves
- Safety goggles

Always wear safety goggles and gloves when drilling!
Use stable and safe ladders or scaffolding!

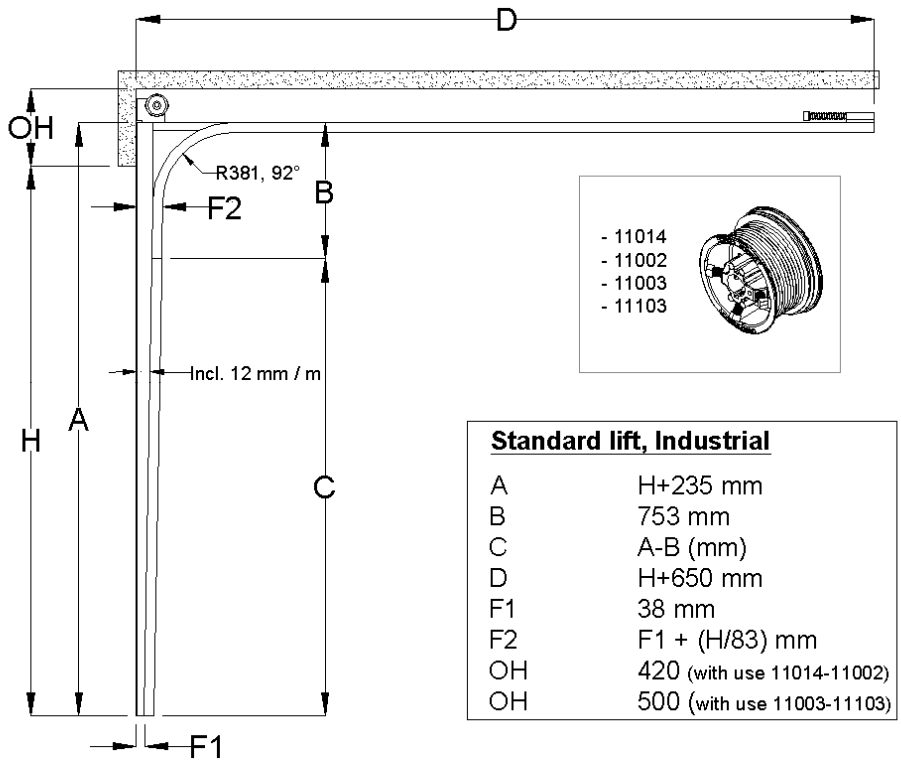
4.4 Systems and system drawings

We use the following 5 systems (lifts):

- Standard system	ST	see 4.4.1
- Standard roof line system	ST pitch	see 4.4.2
- High system	HL	see 4.4.3
- High roof line system	HL pitch	see 4.4.4
- Vertical system	VL	see 4.4.5
- Vertical system with central power unit	VL mid	see 4.4.6

The following pages feature system drawings for the systems mentioned.

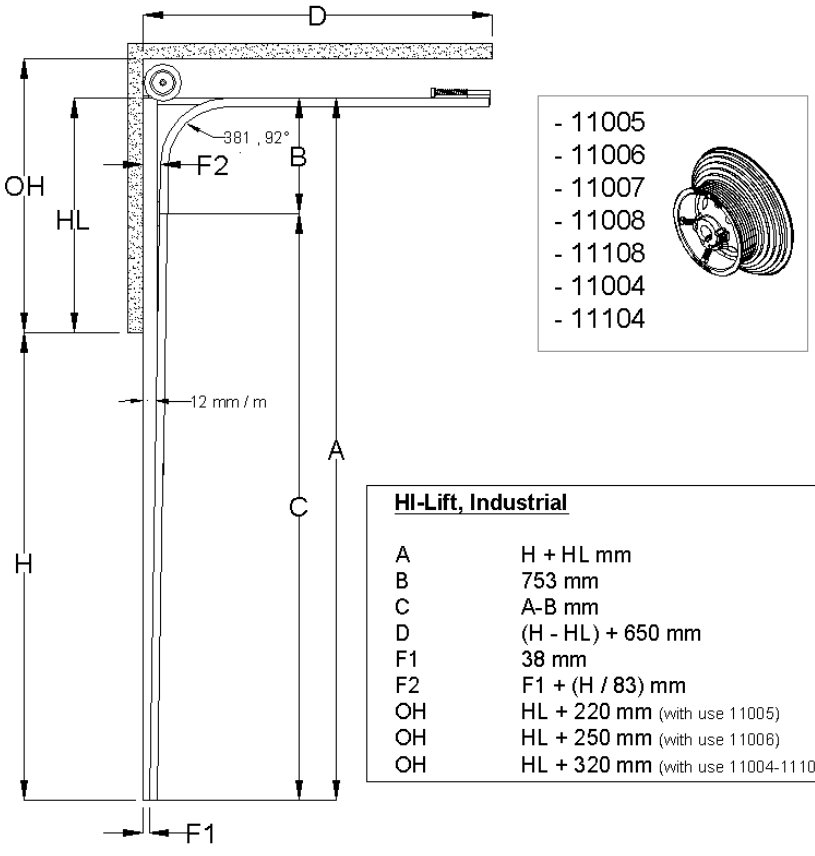
4.4.1 System drawing: Standard lift



Standard lift, Industrial

A	H+235 mm
B	753 mm
C	A-B (mm)
D	H+650 mm
F1	38 mm
F2	F1 + (H/83) mm
OH	420 (with use 11014-11002)
OH	500 (with use 11003-11103)

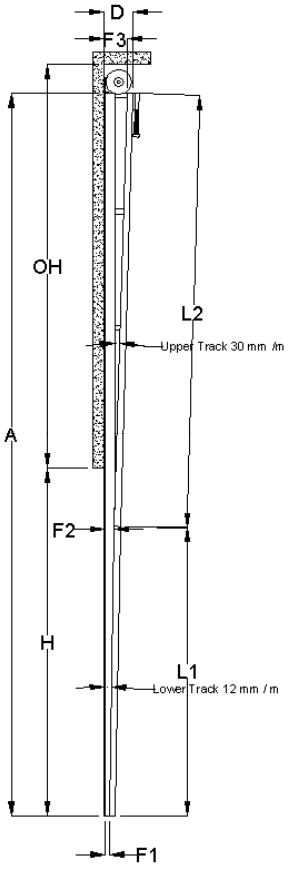
4.4.2 System drawing: High lift



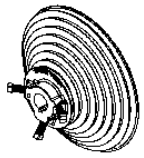
HI-Lift, Industrial

A	H + HL mm
B	753 mm
C	A-B mm
D	(H - HL) + 650 mm
F1	38 mm
F2	F1 + (H / 83) mm
OH	HL + 220 mm (with use 11005)
OH	HL + 250 mm (with use 11006)
OH	HL + 320 mm (with use 11004-11104-11007-11008-11108)

4.4.3 System drawing: Vertical lift



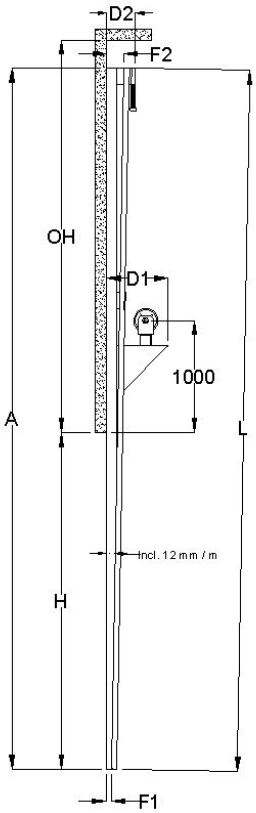
- 11009
- 11010
- 11012
- 11112



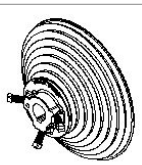
Vertical Lift, Industrial

A	(2 x H) + 250 mm
D	F2 + 53 mm
F1	38 mm
F2	F1 + (L1 / 83) mm
F3	F2 + (L2 / 33) mm
L1	H - 250 mm
L2	H + 250 mm
OH	H + 500 mm (with use 11009)
OH	H + 550 mm (with use 11010)

4.4.4 System drawing: Vertical lift with central power unit

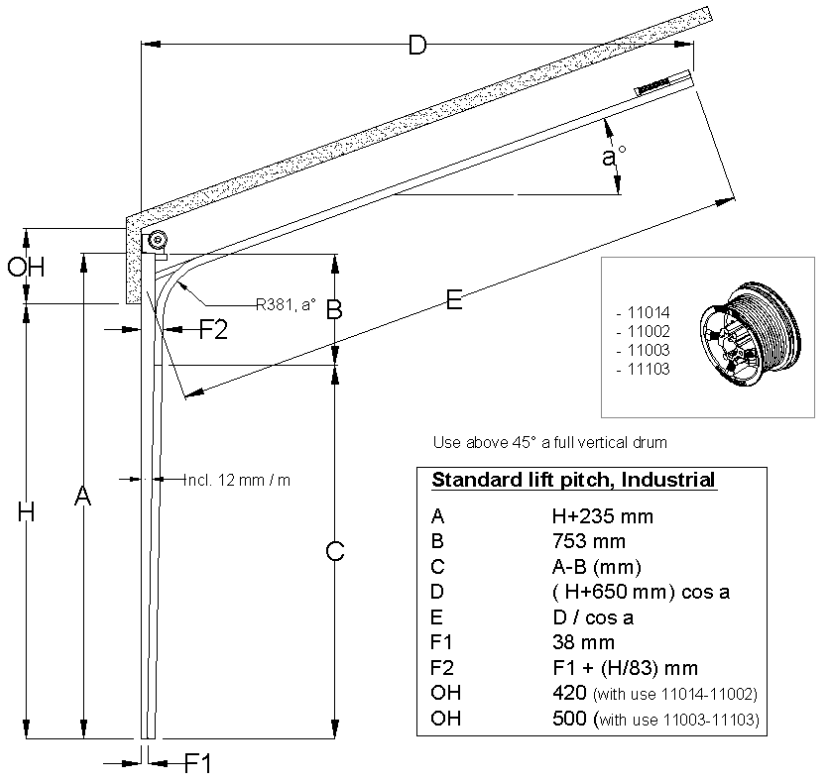


- 11009
- 11010
- 11012
- 11112



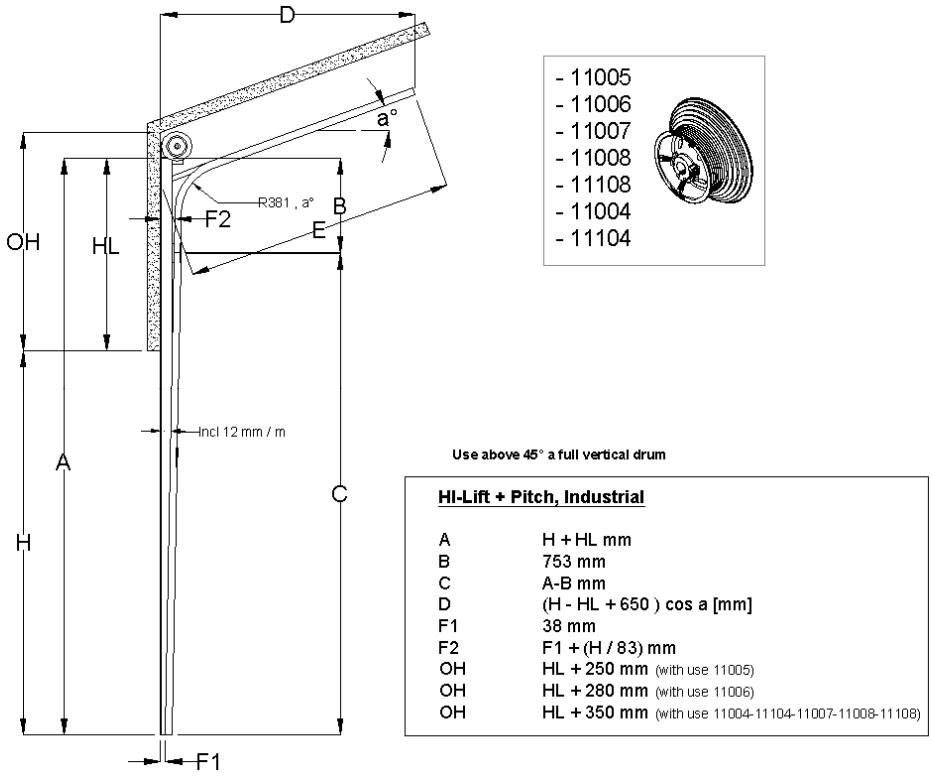
Full Vertical	
A	(2 x H) + 250 mm
D1	500 mm
D2	F2 + 100 mm
F2	F1 + (L / 83) mm
L	A
OH	H + 250 mm

4.4.5 System drawing: Standard roofline lift



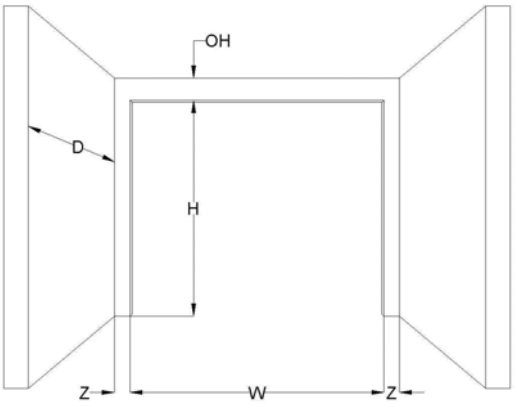
Standard lift pitch, Industrial	
A	H+235 mm
B	753 mm
C	A-B (mm)
D	(H+650 mm) cos a
E	D / cos a
F1	38 mm
F2	F1 + (H/83) mm
OH	420 (with use 11014-11002)
OH	500 (with use 11003-11103)

4.4.6 System drawing: High roofline lift



HI-Lift + Pitch, Industrial	
A	H + HL mm
B	753 mm
C	A-B mm
D	(H - HL + 650) cos a [mm]
F1	38 mm
F2	F1 + (H / 83) mm
OH	HL + 250 mm (with use 11005)
OH	HL + 280 mm (with use 11006)
OH	HL + 350 mm (with use 11004-11104-11007-11008-11108)

4.5 Installation details

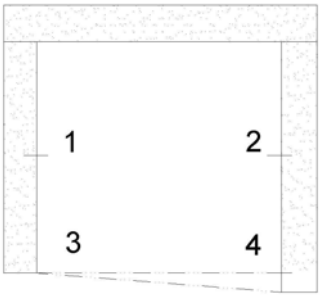


- Make sure the location for the track sets to be installed is level and that the construction is strong enough to carry the track sets.
- Ensure the floor is level and devoid of irregularities. If not, fill in.
- Before starting on the installation, assess whether the mounting place fulfils the minimum requirements (*figure right and system drawings)*

W = clear width
H = clear height
OH = clearance above
Z * = side clearance*
D = installation depth

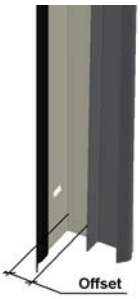
* for each system: minimum 100mm, excl. slip-on drive

4.6 General installation of vertical track sets

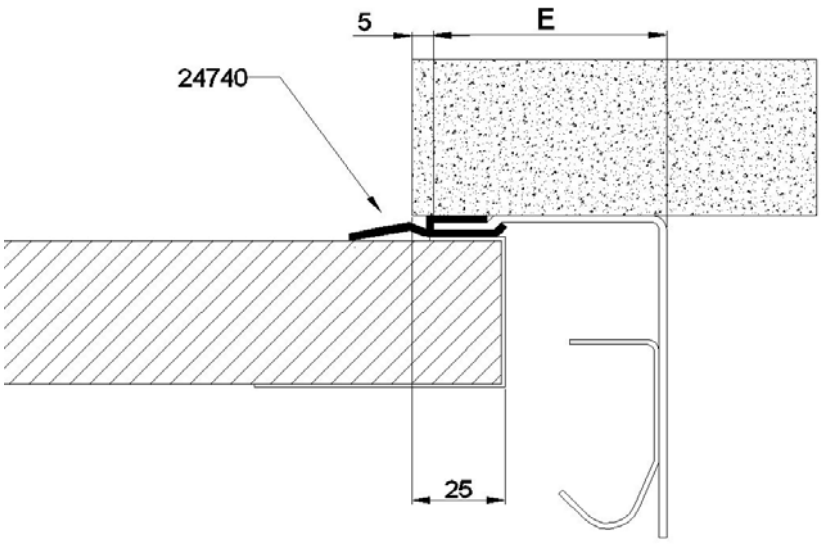


Mark line (1) on the wall.
Then draw line (2) using a spirit level.
Then add markings (3) and (4) for the bottom alignment.
Mount the side seal to the already assembled vertical track set (L-angle and guide track) and if necessary cut to size.
Mount both vertical track set sections against the wall or construction ensuring they are level at point (3) and (4). Make sure they run parallel and are level in both directions. *See figures 2 and 3*

Ensure both L-angles are parallel and at right angles with line 3-4.



The bottom offset depends on the cable break protection used (see 4.12.3)
For type 25450: OFFSET: 34 mm
For type 25453: OFFSET: 34 mm



Fixings for vertical track sets

The fixing materials needed for mounting this track set to the wall or construction are included in this fitting set! The installer is responsible for ensuring that the mounting place is structurally strong enough to carry this industrial door. The installer is also responsible for the correct fixings for the relevant structure (brick, concrete, steel, wood).

The value used for measurement depends on the wind load class and door size!
If class 2: 620 Pa = N/m² (break load)
If class 3: 965 Pa = N/m² (break load)
If class 4: 1375 Pa = N/m² (break load)

Example: door size 5000x4000 20m²
Wind load class 3

Force against door panel: ➔ F=PxA 20x620= 19300N

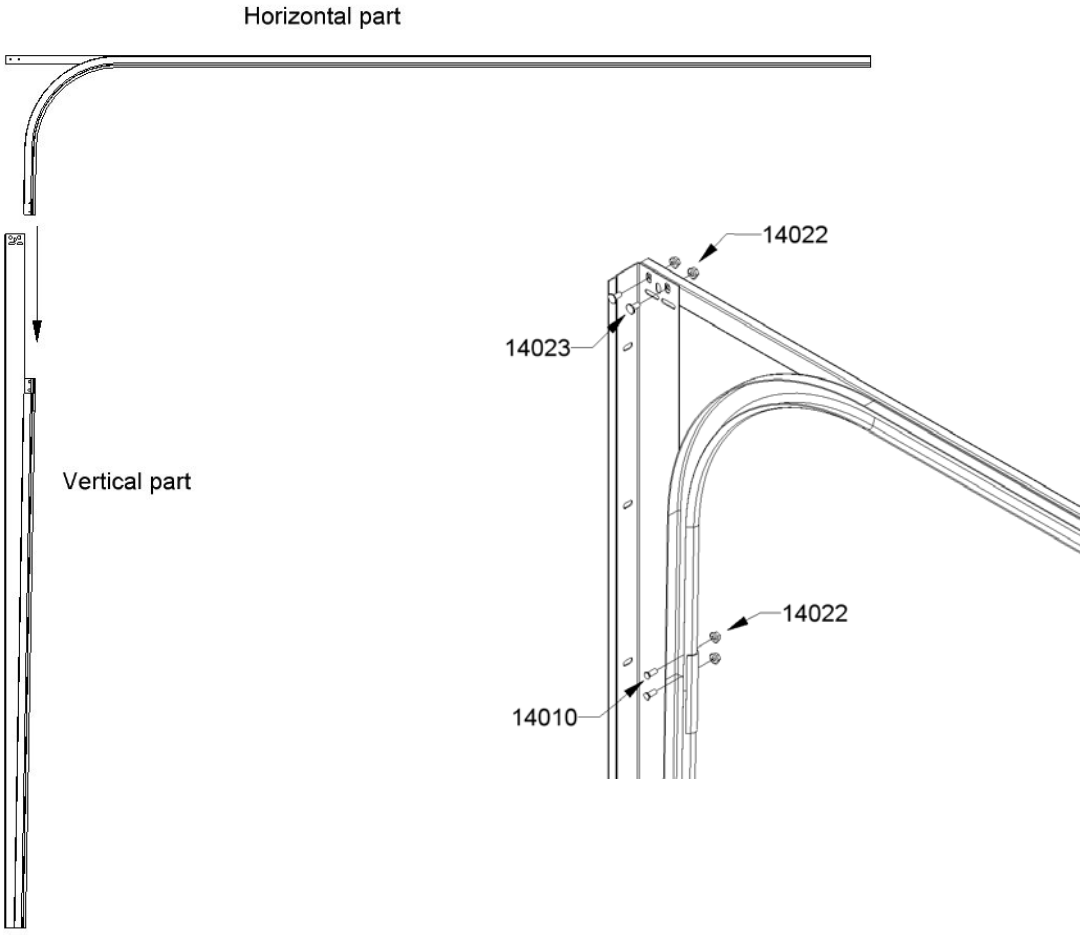
Refer to appendix 3 for wire strength and number of fixings for vertical track sets.

4.6.1 Standard system (ST)

The standard system is distinguished by the fact that, when opened, the door panel immediately goes onto the horizontal section of the track set.
The track set comprises 2 sections that are welded, bolted or riveted together.
For the correct connecting method, see: 3.6 Connections

The length of various items such as guide tracks and L-angles and associated item numbers is obtained using the DOCO 2000 programme.

Installation:
The vertical section comprises the L-angle with seal and guide track. (Assembly using 4.6)
The horizontal section comprises a bend (guide track) and a stiffening profile.
These two sections are connected using a sleeve. *See figure.*

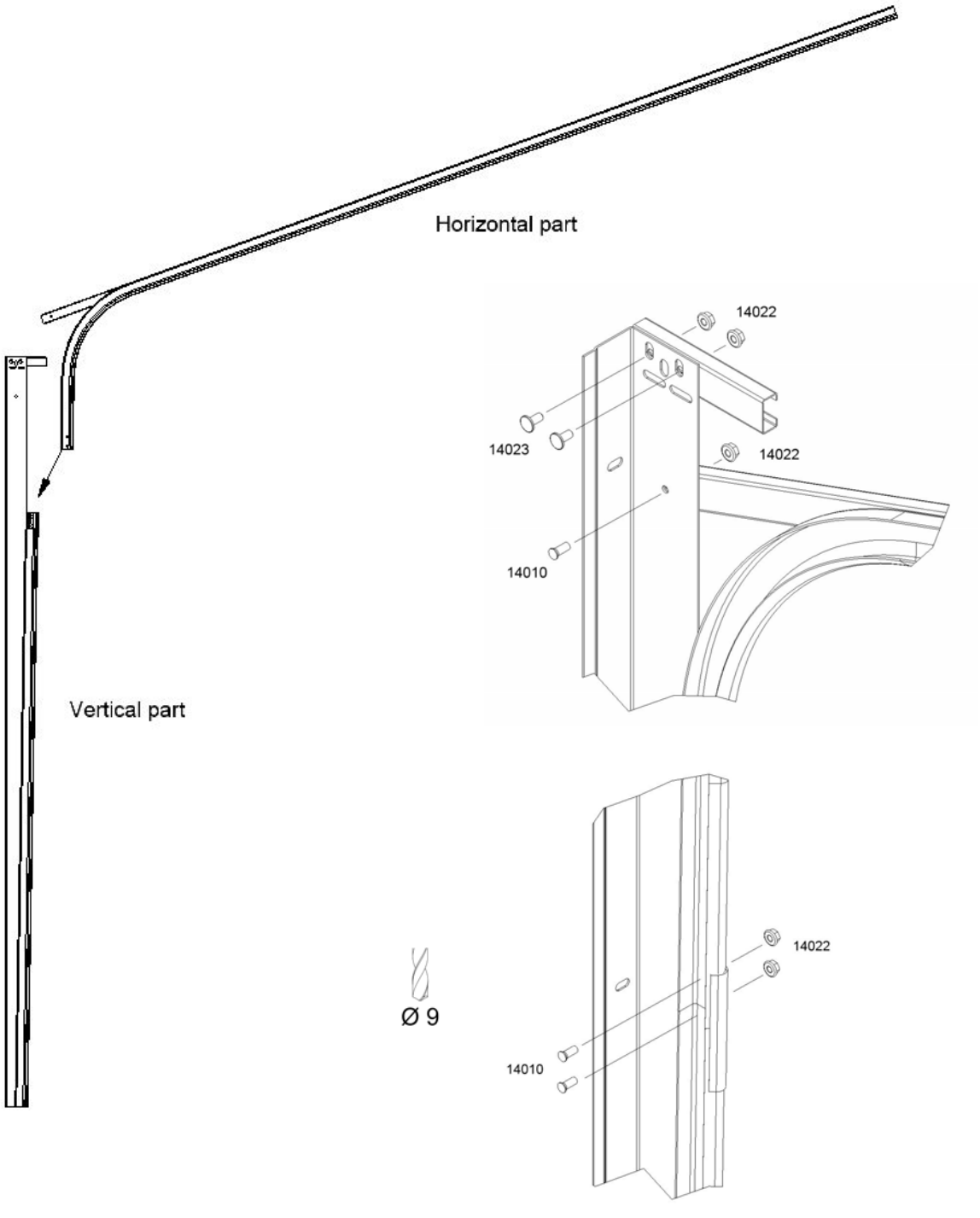


4.6.2 Standard roofline system (ST pitched)

A standard roofline system is identified by the fact that, when opened, the door panel immediately goes onto the 'horizontal' section of the guide track under the roof edge.
The track set comprises 2 sections that are welded, bolted or riveted together.
For the correct connecting method, see: 3.6 Connections

The length of various items such as guide tracks and L-angles and associated item numbers is obtained using the DOCO 2000 programme.

Installation:
The vertical section comprises the L-angle with seal and guide track. (Assembly using 4.6)
The 'horizontal' section comprises a bend (guide track) and a stiffening profile.
These two sections are connected using a sleeve. *See figure.*

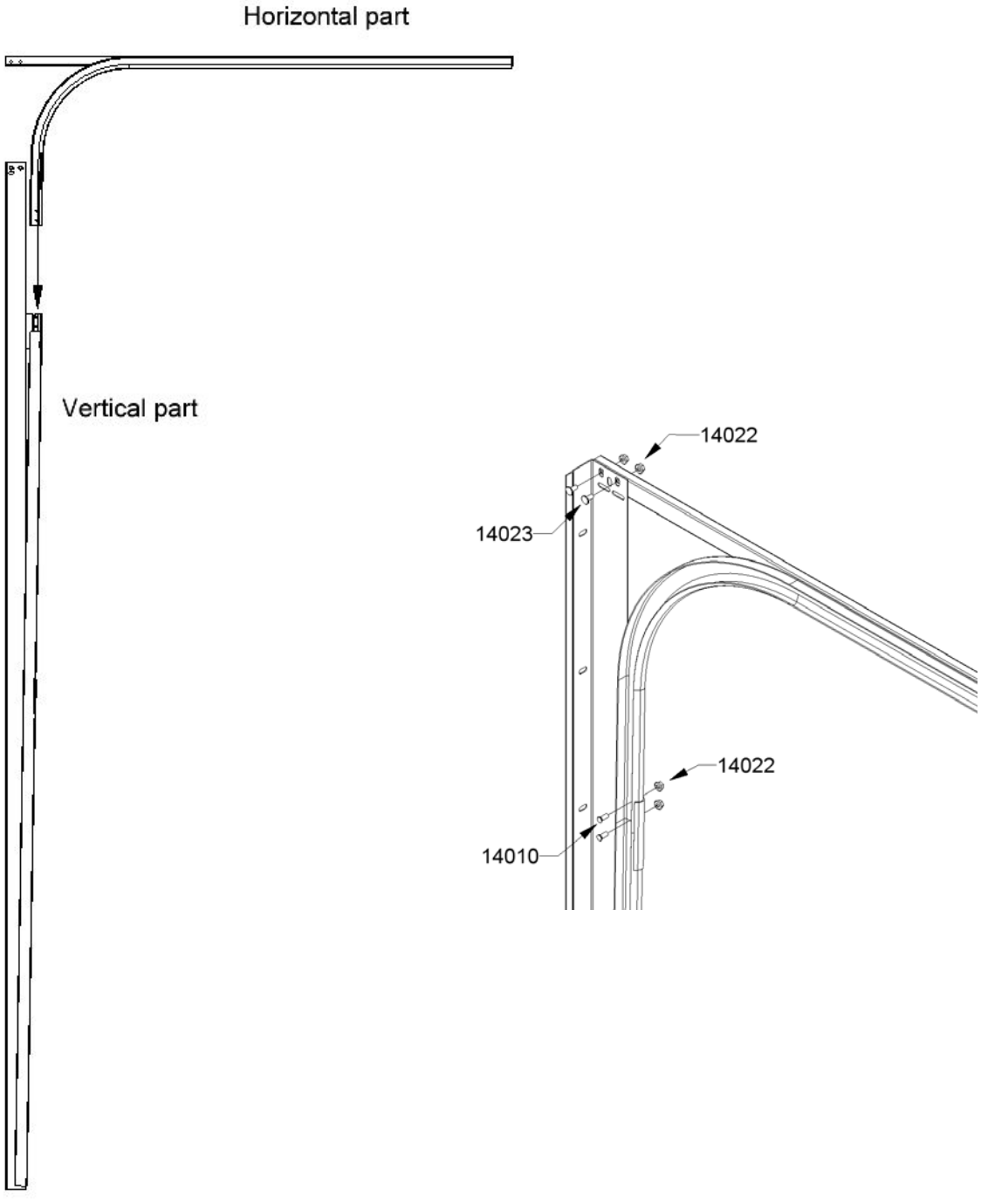


4.6.3 High lift (HL)

A high lift system is characterized by the fact that, when opened, the door panel goes up first before it follows the horizontal section of the track.
The track set comprises 2 sections that are welded, bolted or riveted together.
For the correct connecting method, see: 3.6 Connections

The length of various items such as guide tracks and L-angles and associated item numbers is obtained using the DOCO 2000 programme.

Installation:
The vertical section comprises the L-angle with seal and guide track. (Assembly using 4.6)
The 'horizontal' section comprises a bend (guide track) and a stiffening profile.
These two sections are connected using a sleeve. *See figure.*

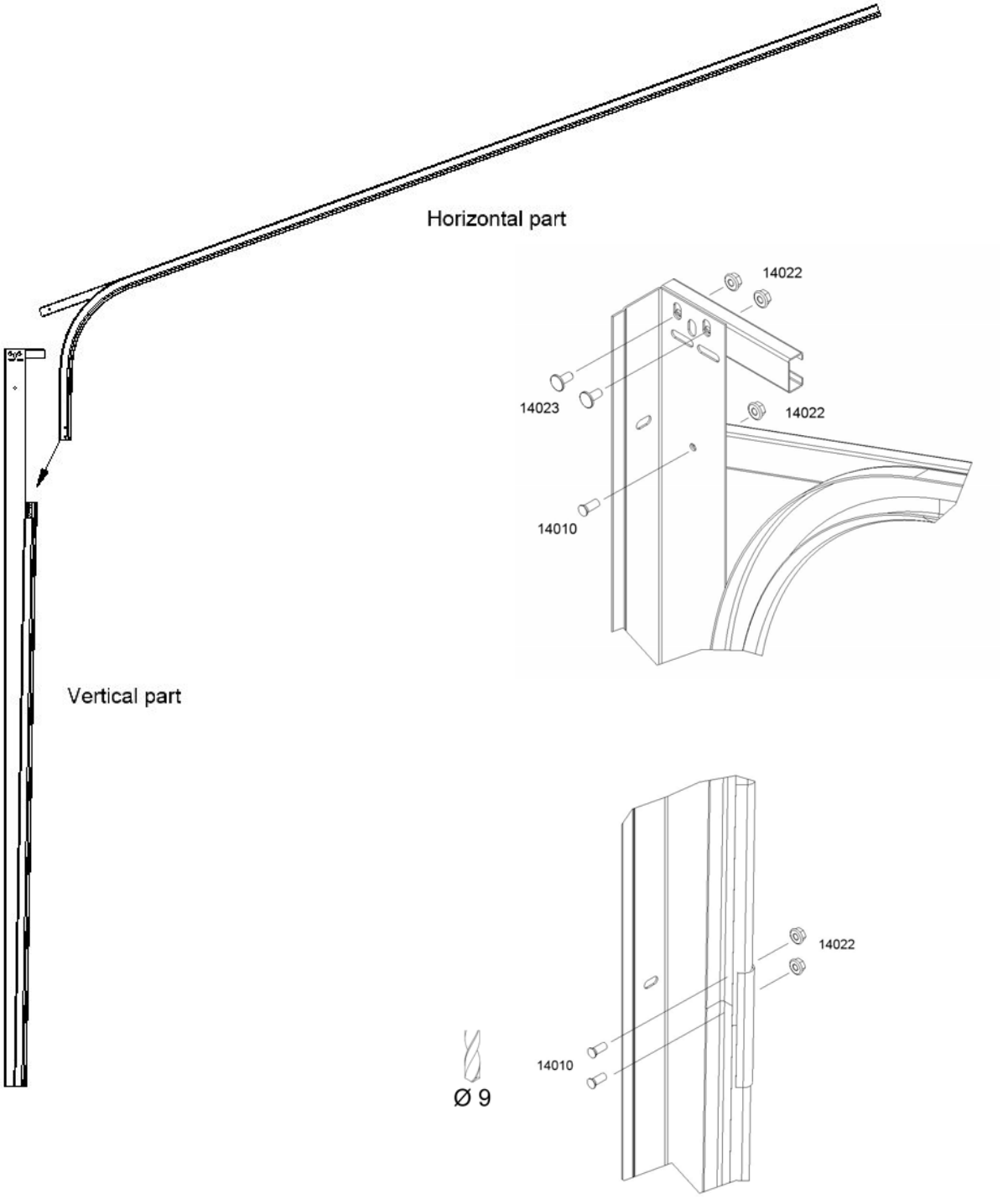


4.6.4 High roofline lift (HL pitched)

A high roofline system is characterized by the fact that the door panel first goes up vertically before it follows the 'horizontal' section of the track set below the edge of the roof.
The track set comprises 2 sections that are welded, bolted or riveted together.
For the correct connecting method, see: 3.6 Connections

The length of various items such as guide tracks and L-angles and associated item numbers is obtained using the DOCO 2000 programme.

Installation:
The vertical section comprises the L-angle with seal and guide track. (Assembly using 4.6)
The 'horizontal' section comprises a bend (guide track) and a stiffening profile.
These two sections are connected using a sleeve. *See figure.*

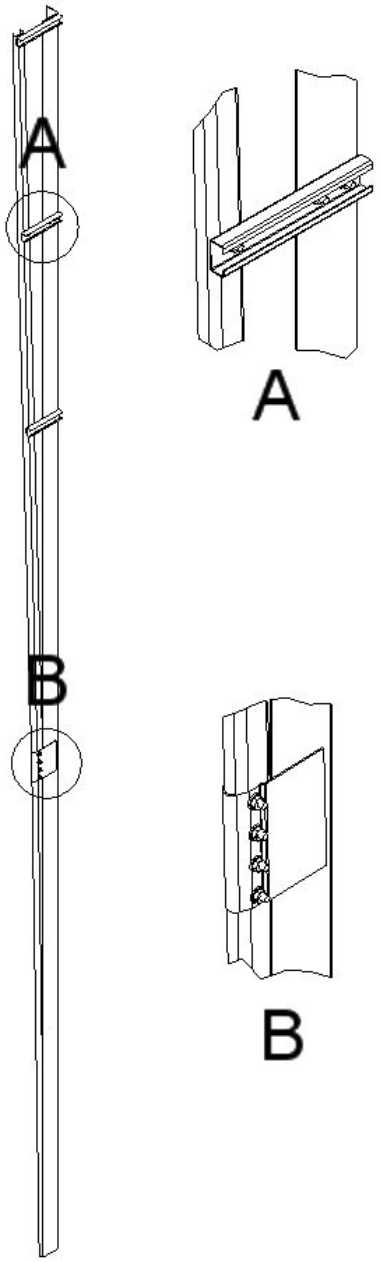


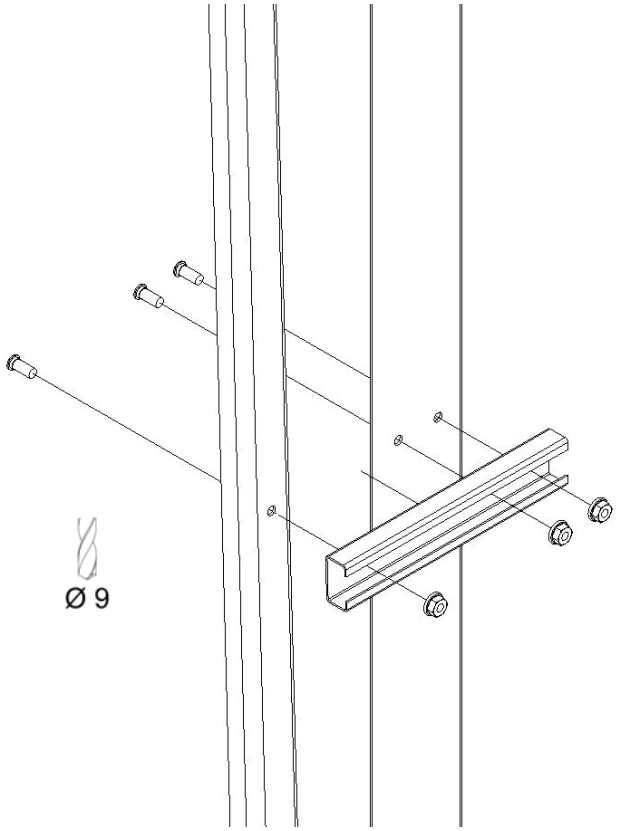
4.6.5 Vertical lift (VL)

A vertical system is characterized by the fact that the door panel goes up vertically.
The track set only comprises 1 section* that is welded, bolted or riveted.
For the correct connecting method see : 3.6 Connections

The length of various items such as guide tracks and L-angles and associated item numbers is obtained using the DOCO 2000 programme.

Installation:
The vertical section comprises the L-angle with seal and guide track. (Assembly using 4.6)
*** Depending on the height of this system, it may be necessary to interconnect the L-angles and guide tracks!**





4.6.6 Vertical lift with central power unit (VL mid)

The track set section is the same as in **4.6.5**

4.7 Connections between guide tracks and vertical angles

For connections between L-angle and construction wall: see 3.3 (General installation of vertical track sets)

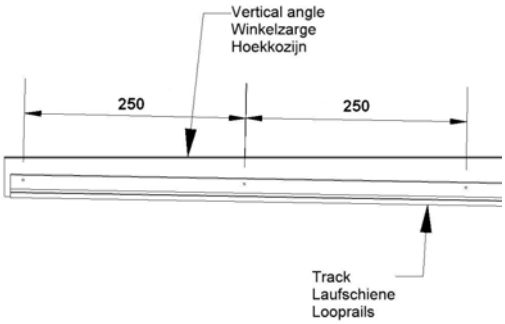
To make sure the track is stable, the connections between guide tracks - L-angle or inter-connections between guide tracks or L-angles need to be fixed in such a way as to comply with EN 12424 (wind force).
The guide tracks and/or L-angles can be connected using three methods:

- Spot-welding
- Bolting
- Riveting

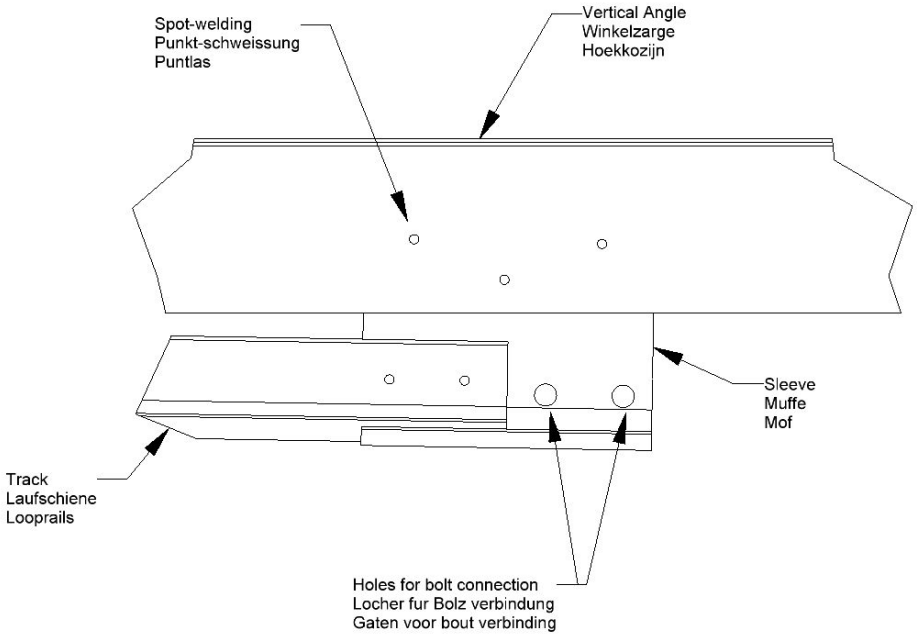
4.7.1 Spot-welding

Spot-welds should be fully welded through, in accordance with the spot-weld equipment instructions/manual.

The following applies for spot-welding:
1 weld / .25 metre (refer to figure on the right-hand side)



Guideline for spot-welding coupling sleeves:
2 spot-welds on the guide track and sleeve and 3 spot-welds divided over vertical angle and sleeve (see figure below).

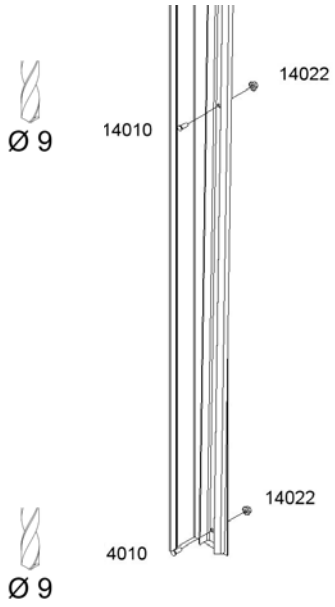


The spot-welds should be finished using a Zinc Spray restoring the parts' galvanic protection layer.

4.7.2 Bolting

If you choose to bolt the track set, then use the following guideline:
Use an M8 bolt (14010 or 14023) and nut (14022 or 14013) every .5 metre. *See figure*
M8 combination, drill Ø 9mm
M6 combination , drill Ø 7mm

Guideline for bolting coupling sleeves:
2 bolts between the guide track and sleeve and 3 bolts spread out over vertical angle and sleeve *(see figure 3.6.1 and read about spot-weld, bolting).*



4.7.3 Riveting

Should you decide to rivet the track set, follow the same procedure as for spot-welding.
Refer to 4.8.1

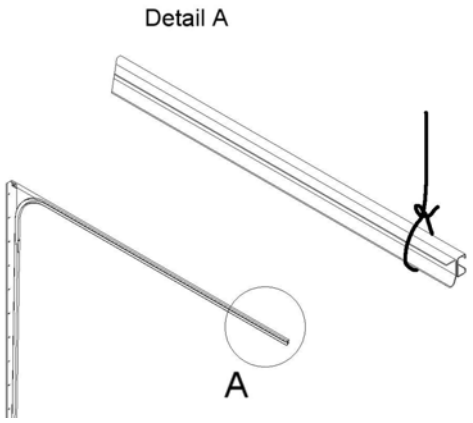
Rivets must be fixed in accordance with the instructions / manual of the Rivet equipment.
Minimum rivet size: 5 mm

4.8 Drop down of the horizontal track set section

The necessary fixing materials needed for mounting this track set to the wall or construction are included in this fitting set! The installer is responsible for ensuring that the mounting place is structurally strong enough to carry this industrial door. The installer is also responsible for the correct fixings for the relevant structure (brick, concrete, steel, wood).
Therefore, you must take the weight of the door blade into account and the fact that the door blade causes a dynamic load.

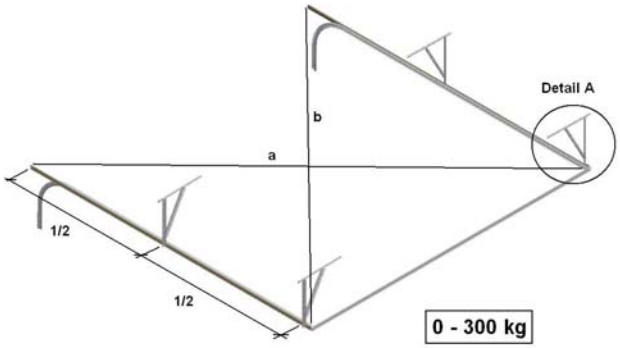
Once the vertical track set section has been mounted against the wall or construction, the horizontal track set section can be mounted. Paragraph 4.7 provided information about connecting the vertical and horizontal track set sections. This paragraph gives information on how to fix the horizontal track set section to the roof construction.

- Position the horizontal track set section and fix it to the vertical track set section (already done at 4.7).
- Support the end of the horizontal track set section by temporarily hanging it from the roof construction using a rope. (see figure)
- Now fix the drop down construction to the horizontal track set section and then to the roof construction (see figures).

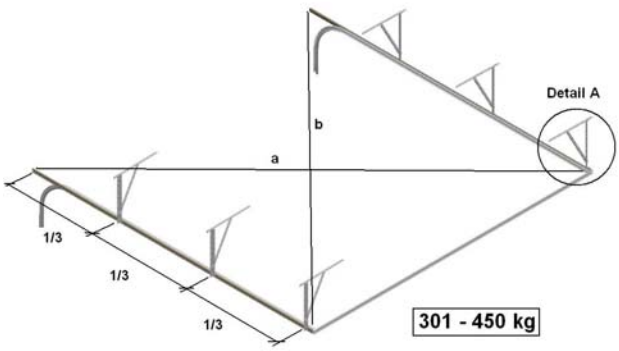


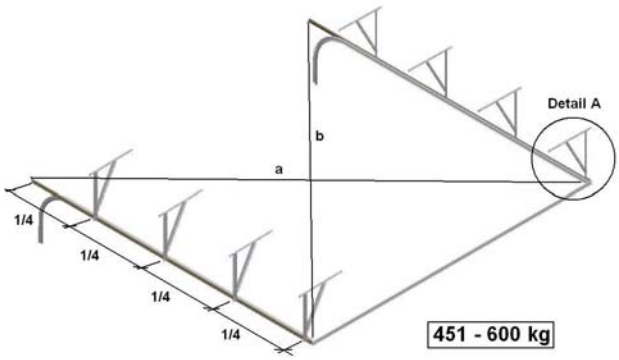
4.8.1 Drop down points

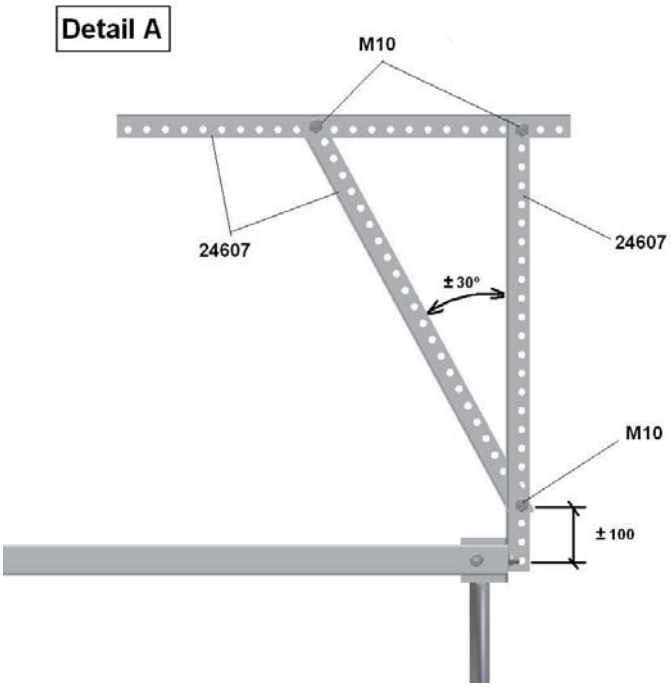
0 – 300 kg. use 4 drop down points (min. M8, steel quality 8.8)
301 – 450 kg. use 6 drop down points (min. M8, steel quality 8.8)
451 – 600 kg. Use 8 drop down points (min. M8, steel quality 8.8)

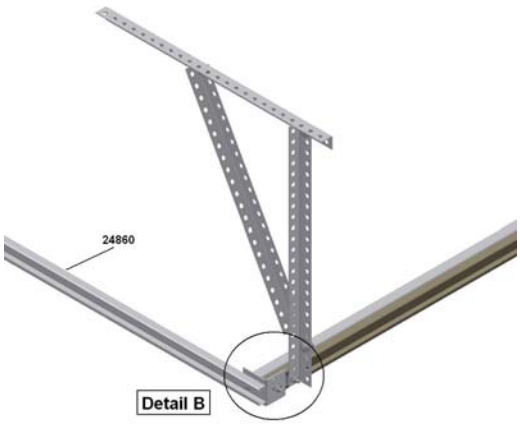


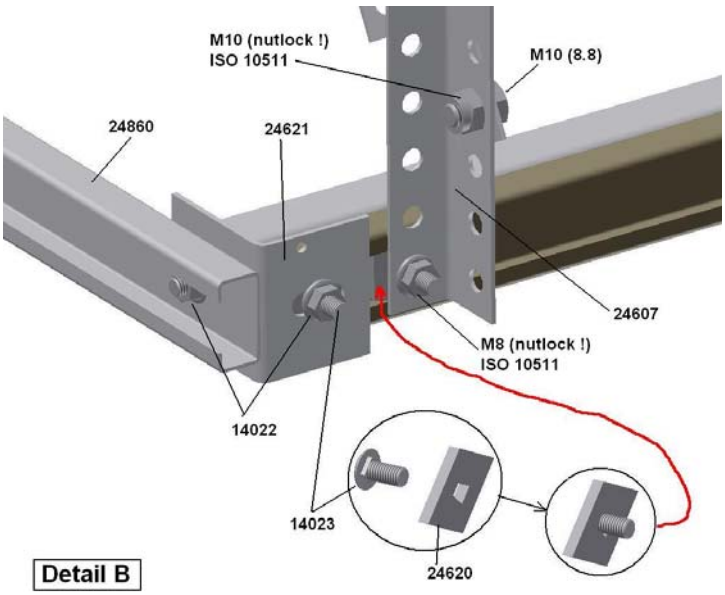
Important observations:
- Make sure that the spring buffers for the last drop down point are mounted . *Refer to 4.9*
- For the last separator construction refer to 4.8.2
- Use an M8/M10 8.8 steel quality self-tightening hexagonal nut with a synthetic DIN 985 ring (ISO 10511)
- Make sure the angle of the "triangular construction" is Approx. 30 º.
- NEVER weld the suspension points!!





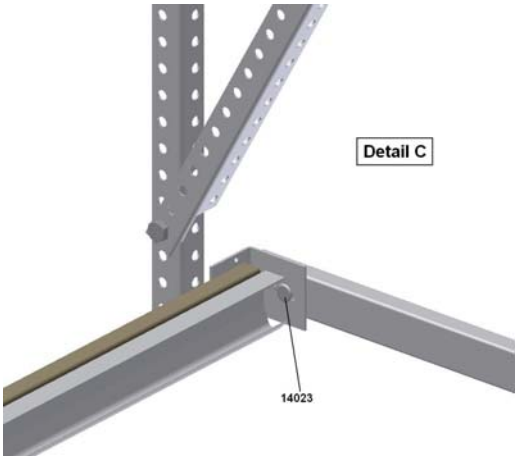

Detail A
M10
24607
24607
±30°
M10
±100


24860
Detail B


M10 (nutlock !)
ISO 10511
M10 (8.8)
24860
24621
24607
M8 (nutlock !)
ISO 10511
14022
14023
24620
Detail B

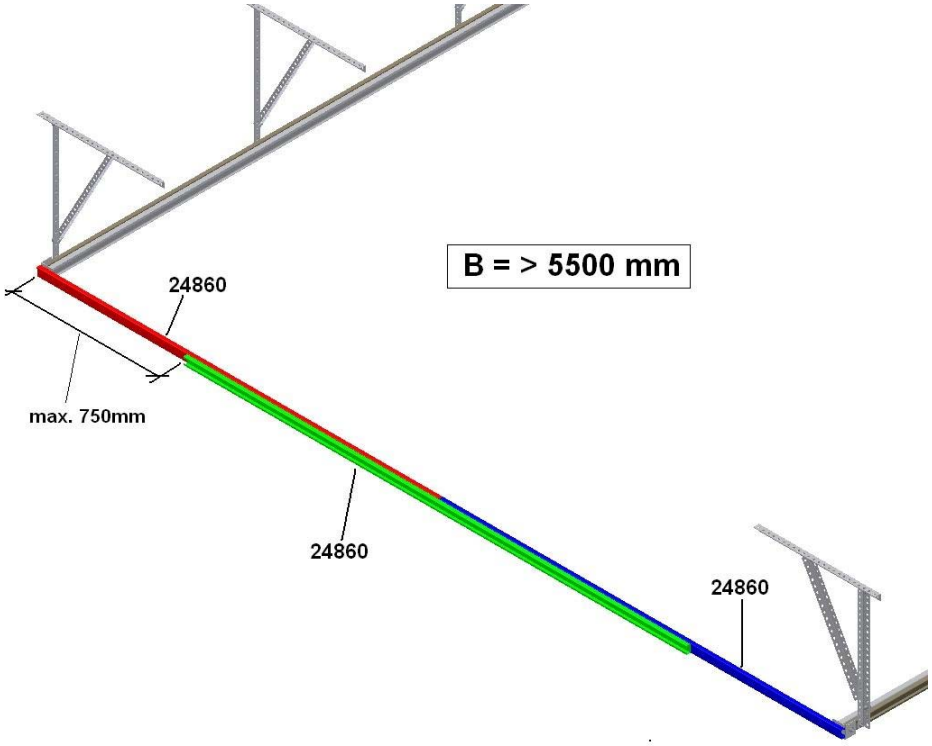
4.8.2 End separator profile for doors <5499

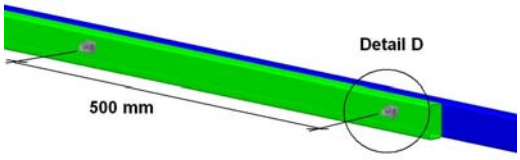
ALL industrial doors must be equipped with an end separator profile (24860)
This serves to limit the extent to which the track with the strengthening profile bends.
Refer to details B and C (detail B on page 21)

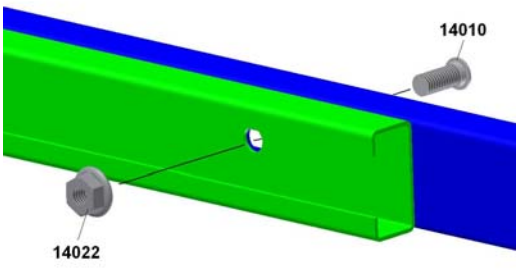


4.8.3 End separator profile for doors wider than > 5550

For doors >5001 a double C rail construction must be used.
The C rails are linked using M8 bolts (14010) and M8 nuts (14022), every 500 mm., refer to the figures below.

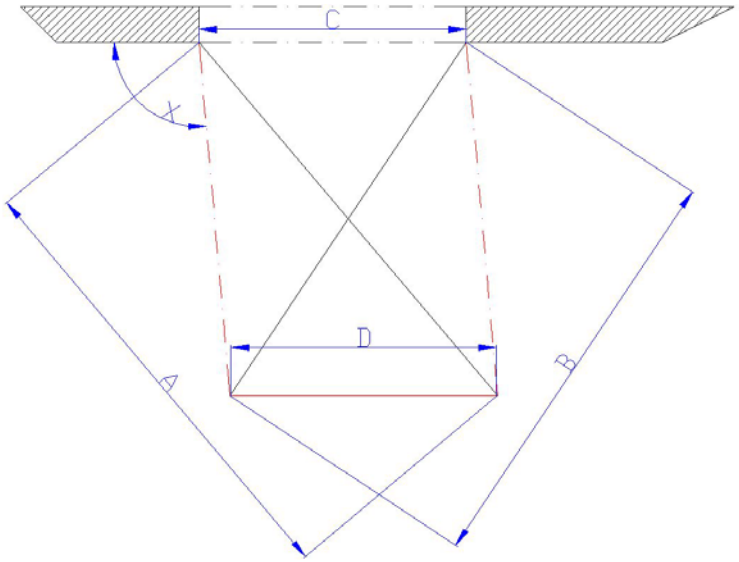






Detail D

- Now check the following: the horizontal sections should be perpendicular to the door panel and/or wall construction surface, and X should be 90 degrees.
- Measure C and D and ensure they are equal. If not, correct the angles.
- Measure A and B and ensure they are equal. If not, correct the angles.
- Your track set is now aligned.

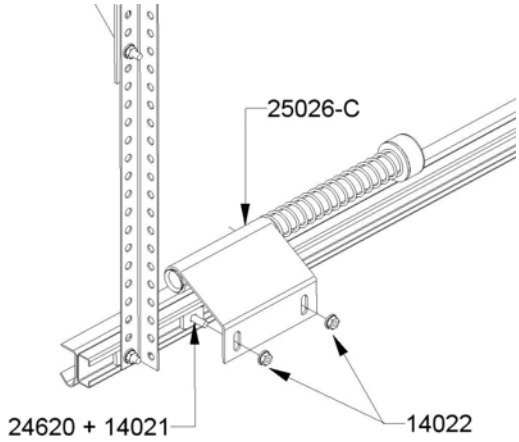


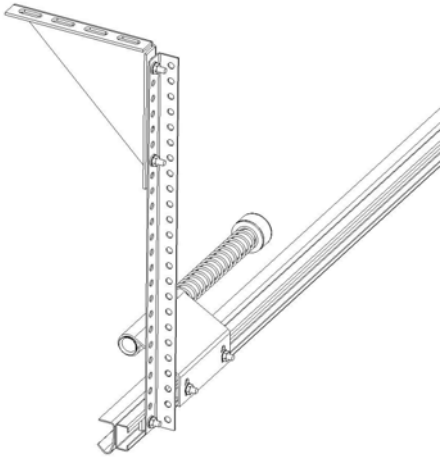
4.9 Spring buffers

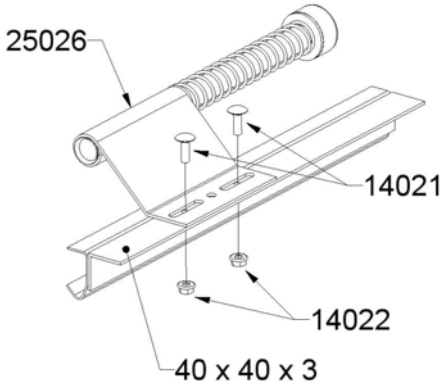
Fix the spring buffers using 2x (14021 + ((24620)) and 2x nut 14022.
The next consecutive items are installed in a similar way:

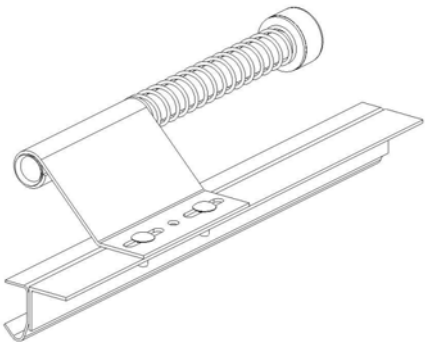
- 25026	short version (pair)	vertical angle installation
- 25026-C	short version (pair)	C track installation
- 25330+ 25326	universal short version (unit)	C track or angle installation
- 25330+ 25341	universal short version (unit)	C track or angle installation
- 25041	long version (pair)	vertical angle installation
- 25041-C	long version (pair)	C track or angle installation

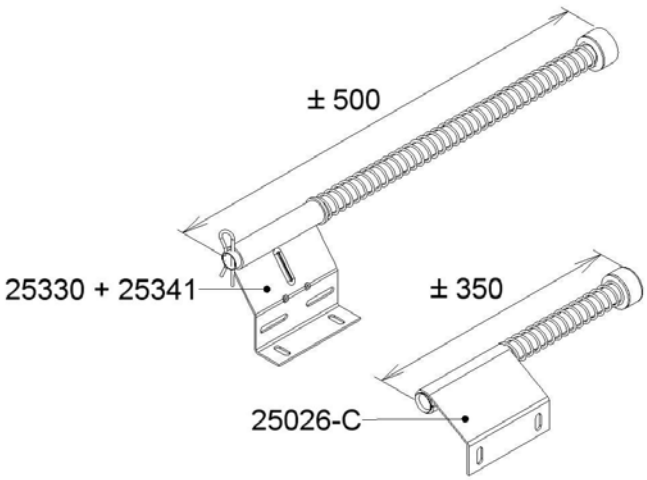
Short version is approx. 350mm long
Long version is approx. 500mm long
See figures on next page.

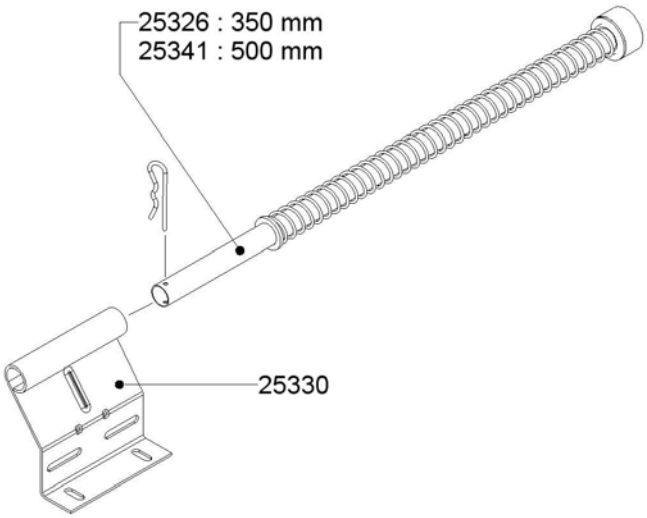

25026-C
24620 + 14021
14022




25026
14021
14022
40 x 40 x 3




± 500
25330 + 25341
± 350
25026-C


25326 : 350 mm
25341 : 500 mm
25330

4.10 Spring set (power unit)

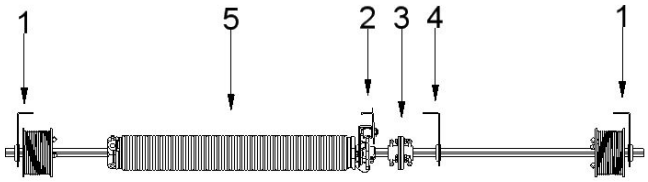
Depending on the size and weight of your sectional door, the configuration of the 'power unit' may look different. Before starting the final installation, we will first discuss the various components needed to assemble the 'power unit'. First, we will discuss the configurations, followed by the various components.

4.10.1 Configurations

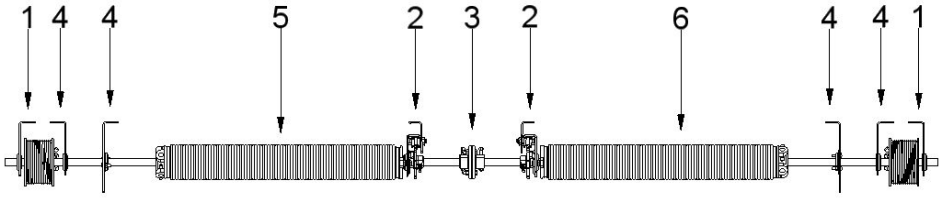
- Shaft with one torsion spring
- Shaft with two torsion springs
- Shaft with four torsion springs

Use the figures below to assess which is applicable to you.

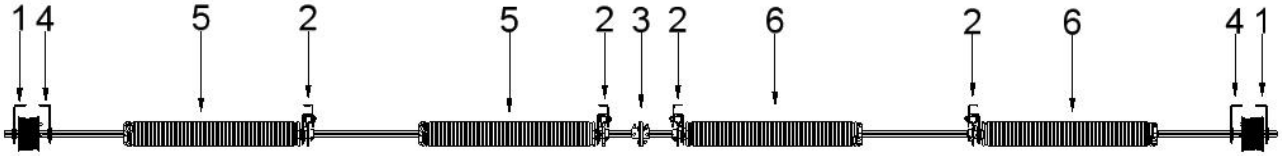
Shaft with one torsion spring.



Shaft with two torsion springs.



Shaft with four torsion springs



General description:

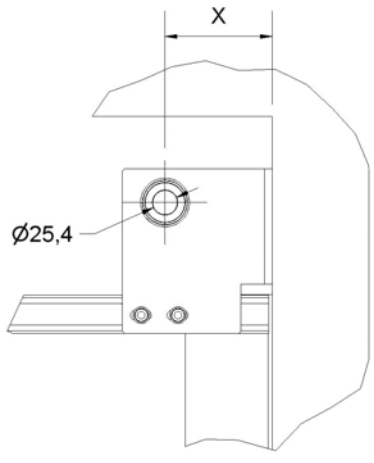
1 : Side bearing console
2 : Spring break protection units with or without offset plate
3 : Couplings (fixed or adjustable)
4 : Centre/support consoles
5 : Right Wound Torsion Springs (RWV)
6 : Left Wound Torsion Springs (LWV)

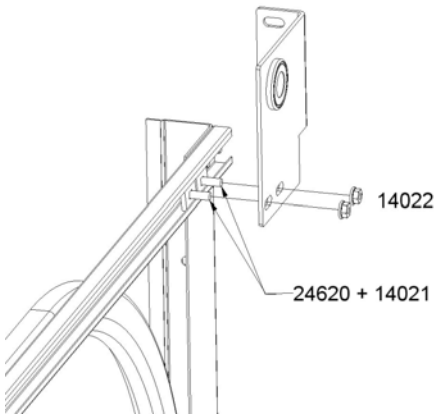
Offset (X)	1	2	3	4	5	6
86	13001 or 13025 + 13026/27	25449	25017 or 25034 or 25042	13013 or 13025 + 13026/27	RWV	LWV
111	13002 or 13025 + 13026/27	25448 + 25449	25017 or 25034 or 25042	13014 or 13025 + 13026/27	RWV	LWV
127	13003 or 13025 + 13026/27	25448 + 25449	25017 or 25034 or 25042	13015 or 13025 + 13026/27	RWV	LWV
152	13004 or 13025 + 13026/27	25448 + 25449	25017 or 25034 or 25042	13016 or 13025 + 13026/27	RWV	LWV

4.10.2 Side bearing plates

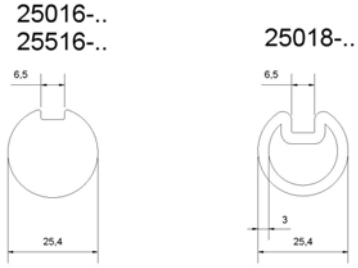
Choose the correct side bearing plate for the table; this depends on the drum or offset X used.
Installation is carried out using paro plates (24620) with bolts (14021) and nuts (14022,14015) *see figure.*

Drum:	Offset (X):	Side bearing plate:	Side bearing plate max. load*
11014 (ST)	86mm	13001	160kg/st
11002 (ST)	111mm	13002	160kg/st
11003 (ST)	127mm	13003	150kg/st
11005 (HL)	111mm	13002	160kg/st
11006 (HL)	111mm	13002	160kg/st
11007 (HL)	127mm	13003	150kg/st
11008 (HL)	152mm	13004	140kg/st
11004 (HL)	152mm	13004	140kg/st
11009 (FL)	127mm	13003	150kg/st
11010 (FL)	152mm	13004	130kg/st
11012 (FL)	190mm	13005	100kg/st
			* provided it is also attached to C track!





4.10.3 Shafts



Choice of:

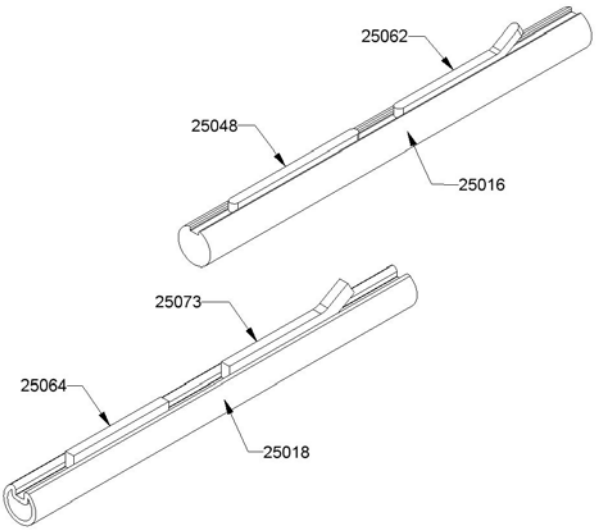
- Hollow shaft with key way 25018- ..
- Solid black shaft 25016- ..
- Solid galvanized shaft 25516- ..

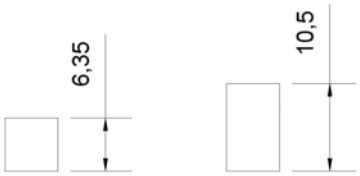
For sectional doors with a clear width of > 4000mm and/or > 200 kg
you should select a solid shaft!

4.10.4 Keys

The purpose of the key is to transmit drive power. Depending on the selected shaft, the correct key should be selected.
For the hollow shaft with key way : 10.5 key height
- 25064 straight version
- 25073 bent version

For the solid shaft : 6.35 key height
- 25048 straight version
- 25062 bent version





4.10.5 Spring break protection 25449

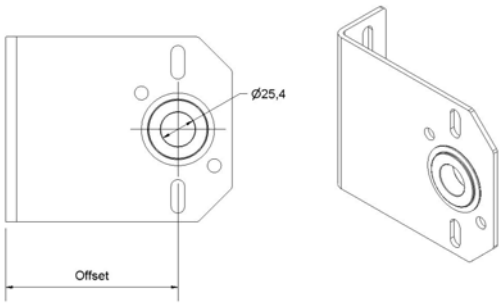
For detailed installation and maintenance instructions, see: Spring break protection manual 25449

4.10.6 Centre/support consoles

Centre/support consoles are designed to give the shaft adequate support (bearing) so the shaft can turn freely without noticeable sagging.
General guideline: 1 centre/support console per 1500mm. (bearing point)
PS spring break protections also count as bearing points.

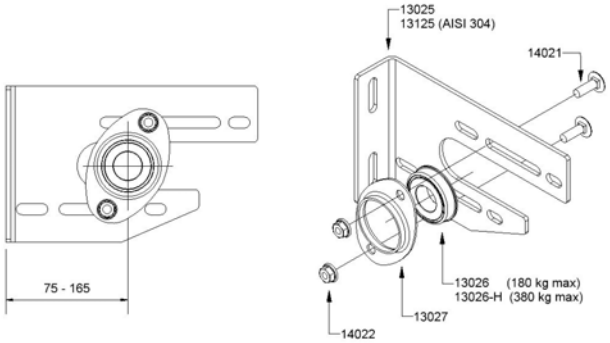
Centre/support consoles with fixed offset (see figure on the right)

13013 : offset 86 max load: 130kg/st
13014 : offset 111 max load: 120kg/st
13015 : offset 127 max load: 110kg/st
13016 : offset 152 max load: 100kg/st



Adjustable support console (see figure below)

Max load: 150kg/st



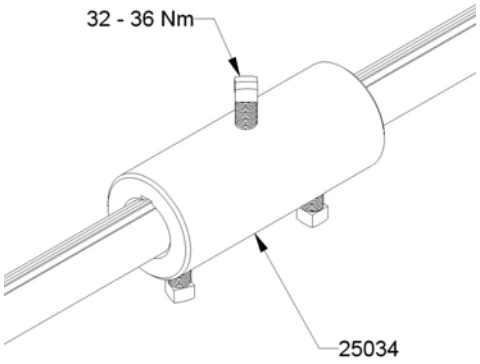
4.10.7 Couplings

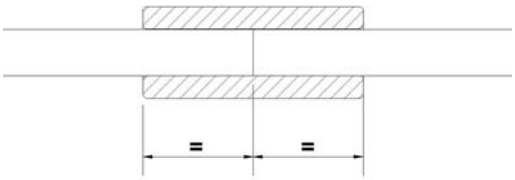
The purpose of couplings is to create a connection between two shaft sections.
There are two types available, namely fixed couplings and adjustable couplings.

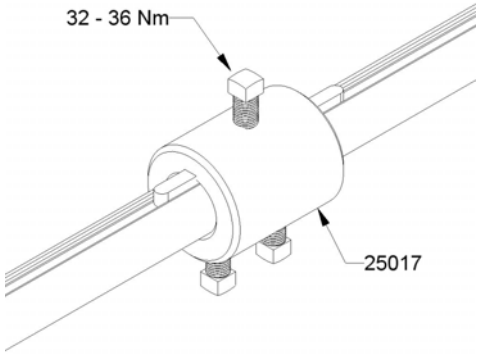
Fixed coupling:
- item 25017
- item 25034

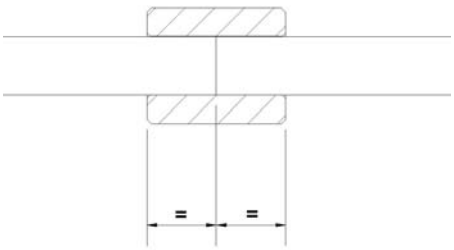
Adjustable coupling:
- item 25042
-

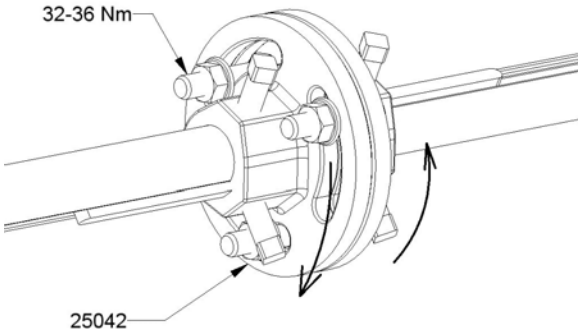
Recommended torque is 32-36Nm

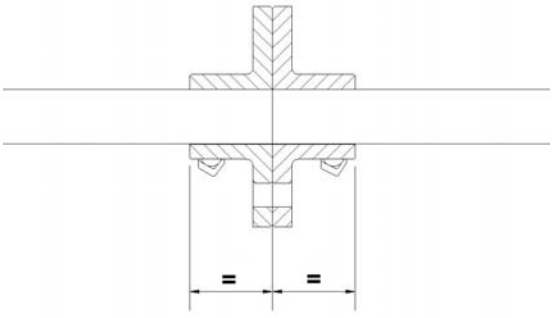








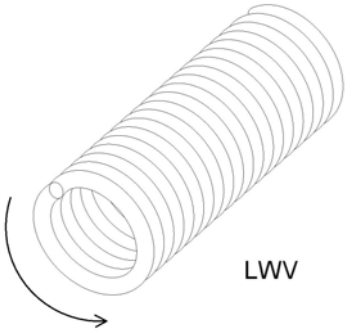


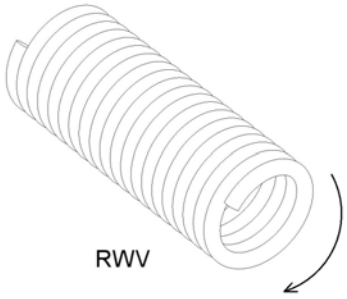


4.10.8 Torsion springs

Calculation using DOOR PROCESSING computer programme.

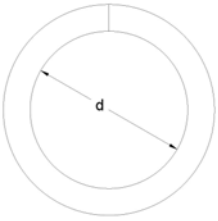
Torsion springs are available in left-handed and right-handed versions.
A left-handed spring can be identified as follows:
Follow the end of the spring back to its centre. If it turns anti-clockwise, then it is a left-handed spring. If it goes in clockwise, it is a right-handed spring.
This is clarified in the figures below.



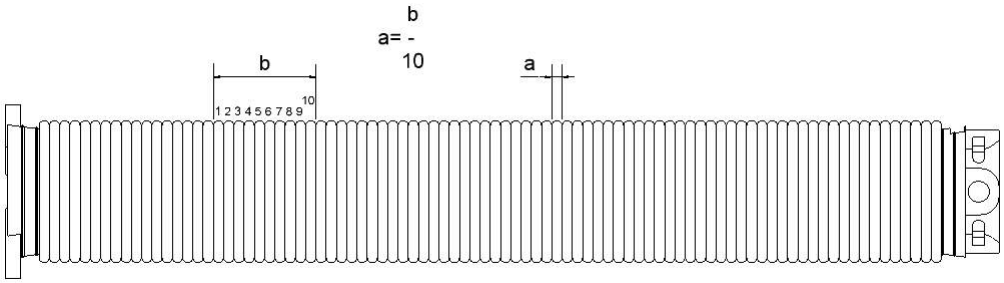


Springs are available in the following sizes:

d:		item series
- 50.8mm	2”	32….
- 67mm	2 5/8”	33….
- 95.25mm	3 3/4”	34….
- 133.35mm	5 ¼”	35….
- 152.40mm	6”	36….



Checking the wire thickness (a) :
The best way is to count 10 windings (b) when unloaded, and measure them.
Then divide this measured value by 10: the result (a) gives you the thickness of the wire. *See figure*



Custom ordered torsion springs should be identified by a label attached to it.
This label will state the following:

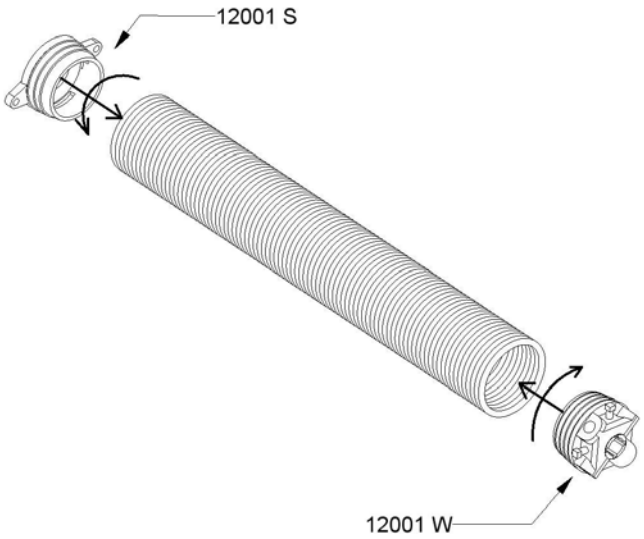
- left or right-handed spring
- spring diameter (d)
- wire thickness (wd)
- spring length (L)
- number of windings of the spring (turns)
- order number
- sectional door dimensions (DMW x DMH)
- your reference (comm)

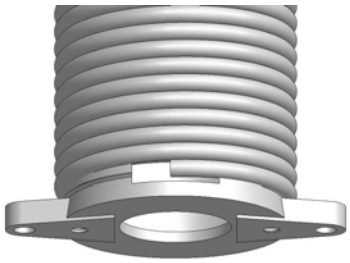
see label:

4.10.9 Create your own torsion springs (turning plugs)

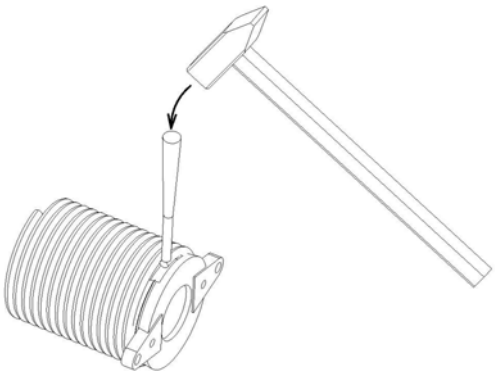
This example shows you how to make a 95.25mm spring with spring heads.
Method of operation:

- Determine the correct spring length.
- Cut the spring to the correct length
- Take item 12001 (universal L/R spring head) and screw it into the torsion spring.
- Turn the spring head to the point where the spring end is half way down the spring head opening.

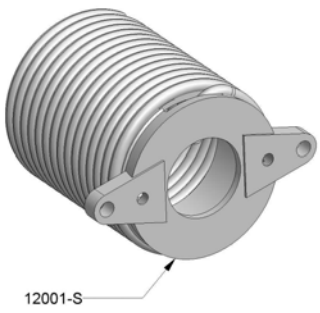




- Heat the ends and bend the spring ends approx. 90° round using a hammer and punch, to secure them properly.
- Repeat the above procedure for the other side.



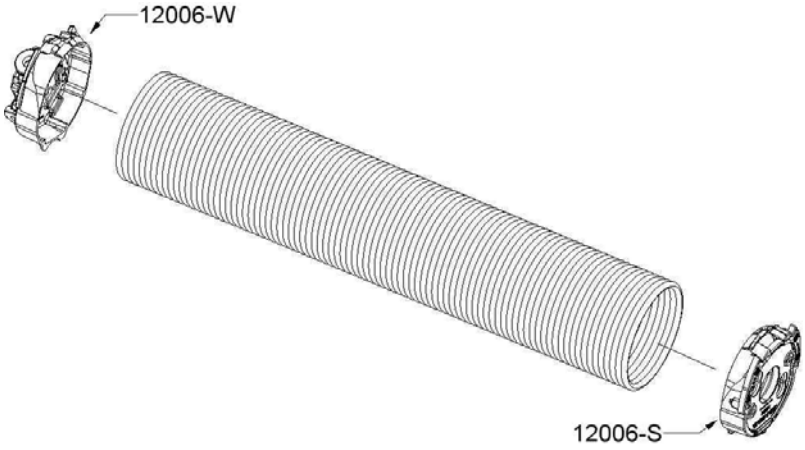
- Your torsion spring is now complete.



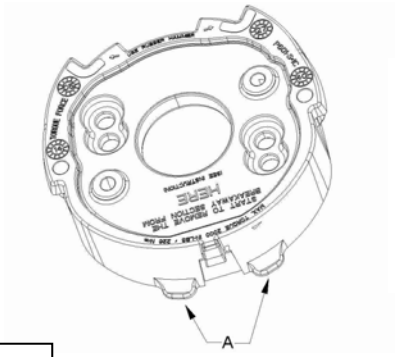
4.10.10 Creating your own torsion springs (impact plugs)

This example shows you how to make a 152.4mm spring with spring heads.
Method of operation:

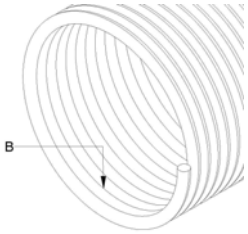
- Determine the correct spring length.
- Cut the spring to the correct length



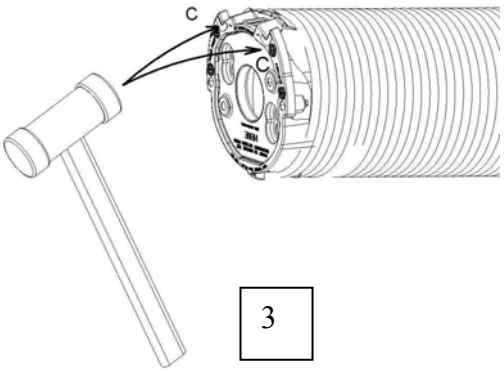
- Take item 12006 (universal L/R spring head) and tap it into the torsion spring. Do this by placing the tabs A (1) behind the second winding B (2) and then tapping the plug into it using a rubber hammer at C (3) (images).



1



2



3

- Keep tapping until the spring head is positioned halfway down the spring head opening (4).
- Heat the ends and bend the spring ends approx. 90° round using a hammer and punch, to secure them properly (5-6).
- Repeat the above procedure for the other side.

4

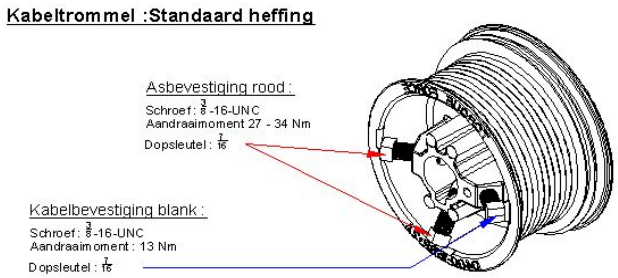
5

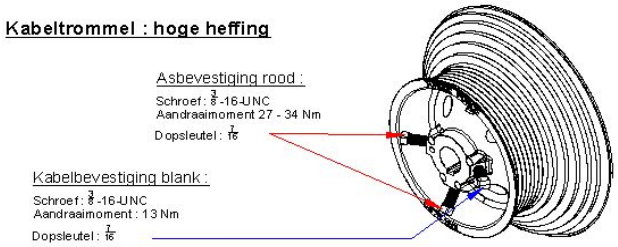
6

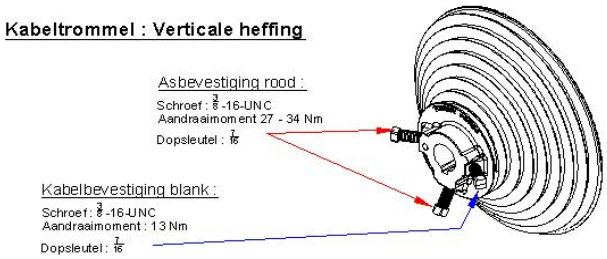
4.10.11 Cable drums

All Cable drums are based on 0.5 safety windings!**

*** Equal to 2 windings **TUV SUD approved** // Ref: TUV: BB-FTA-MUC/re-sc 30604_Besch_torque.doc*





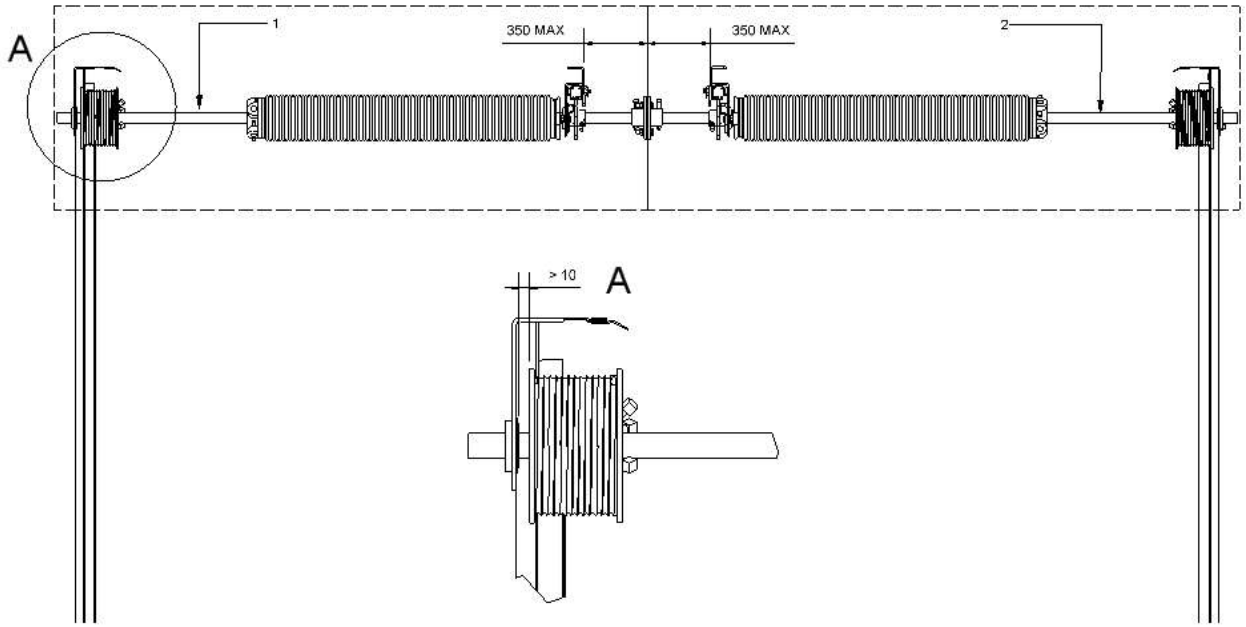


Lift type	Cable drum	Max. height	Max. high lift	Max. door weight	Max. cable diameter	Bearing distance
Standard	11014	3761 mm		340 kg	4 mm	67 mm
Standard	11002	5881 mm		680 kg	5 mm	86 mm
Standard	11003	9866 mm		1100 kg	6 mm	127 mm
High lift	11005	4275- HL mm	1375 mm	250 kg	4 mm	86 mm
High lift	11006	5948- HL mm	1375 mm	455 kg	5 mm	111 mm
High lift	11007	6708- HL mm	3050 mm	455 kg	5 mm	127 mm
High lift	11008	9755- HL mm	3050 mm	1000 kg	6 mm	152 mm
High lift	11004	14148-HL mm	4165 mm	728 kg	6 mm	152 mm
152mm	11009	3350 mm		386 kg	5 mm	127 mm
127mm	11010	5559 mm		600 kg	5 mm	127 mm
Vertical lift	11012	8534 mm		1000 kg	6 mm	178 mm

4.10.12 Spring set assembly (power unit):

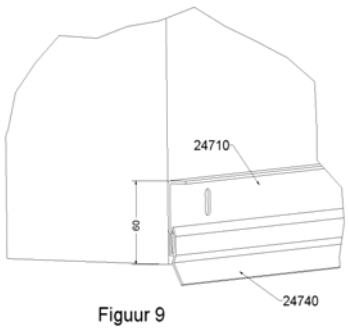
- Assemble the two shaft halves on the ground, as in 4.10.1
- Slide the assembled shaft half (1) into the bearing of the side console, see detail A, and fit the spring break protection console to the steel construction or concrete. Ensure the shaft is level.
- Fit both shaft halves together using the coupling.

Use SUITABLE plugs / screws or bolts / nuts for the relevant base.
Use plugs of 8 or 10mm with hexagonal screws for wall mounting.
Use a minimum of M8 bolts and nuts for mounting to a steel construction (not included).



4.11 Lintel seal installation

Slide the rubber seal (24740 or 24250/550) onto the seal profile (24710).
Fit the seal profile (24710) onto the lintel at the length of the clear width.
Fit the seal profile (24710) at 60mm above the lintel.
Attention! : maximum top panel overlap: 15mm
See figure on the right.



Figuur 9

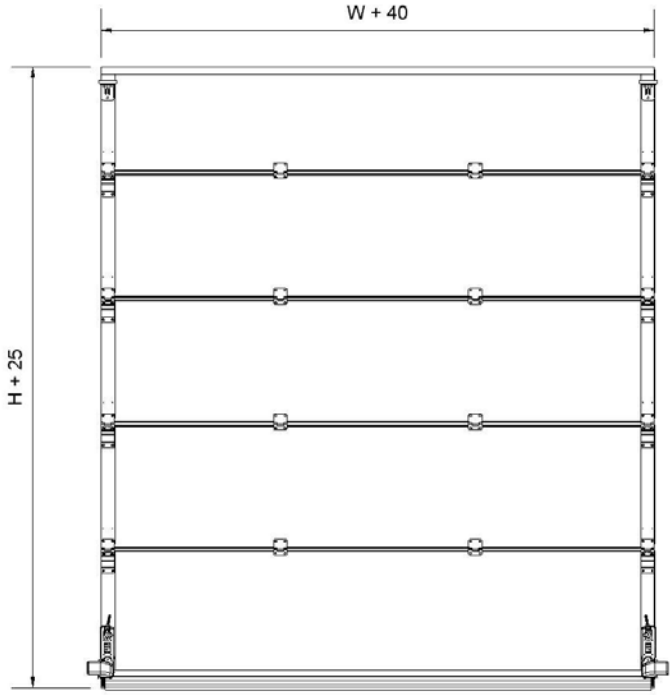
Note:
If a different seal system is used, the classifications according to EN 13241-1 are invalid.

4.12 Panels (general)

As our track sets with hardware can be used UNIVERSALLY in combination with various panel manufacturers, here is a general description of the installation of the panels.

Always ask your panel manufacturer which additional measures, if any, are needed to ensure finger pinch safety.

In general, when using sandwich panels (steel plates with PUR foam), Ø 4.5mm holes need to be drilled. However, check with your panel manufacturer about the actual drill size!
The complete door panel, including aluminium profiles and bottom seal (stop) should comply with the following measurements.



4.12.1 Hardware

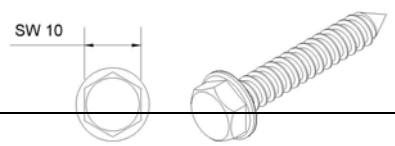
Refer to appendix 4 for the correct selection of hinges for the panel.
The distance between the centre hinges should be divided equally over the length of the panel, see table 1.
The recommended maximum torque for the various parts is detailed in table 2.

Table 1

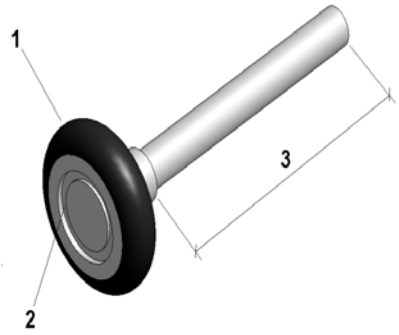
Door width	Number of centre hinges
0-2749	1
2749-3999	2
3999-4999	3
5000-5999	4
6000-7500	5

Table 2

Metal screw Item. 14017	Torque
Bottom console	15Nm
Side hinge	15Nm
Centre hinge	10Nm
Top roll holder	15Nm



4.12.2 Rollers

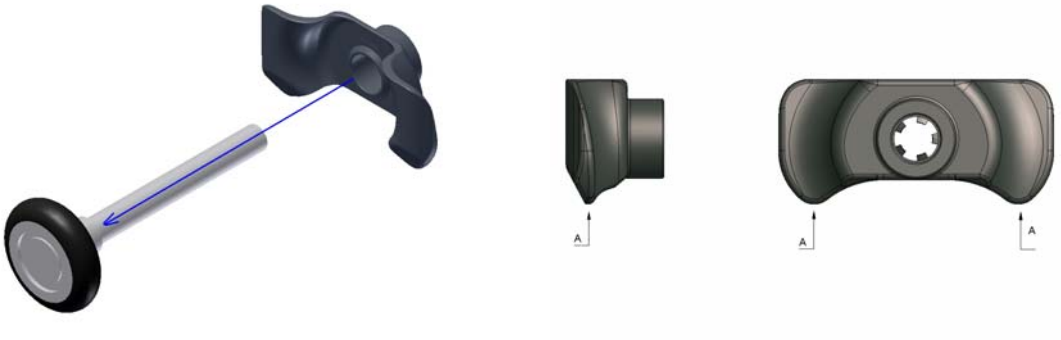


Roller	Wheel colour (1)	Shaft thickness (2)	Shaft length (3)	Bearing (4)	Max. load
25010-E	White	11mm	89mm	normal	< 35 kg / unit
25008	Black	11mm	89mm	normal	< 35 kg / unit
25066	White	11mm	95mm	6200 ZZ precision	< 100 kg / unit
25011-E	White	11mm	170mm	normal	< 35 kg / unit
25251	White	11mm	152mm	6200 ZZ precision	< 100 kg / unit

Roller selection:

Door panel weight <15 kg/m2	+	Door panel width <5000mm	selection:	25010-E 25008 25066
Door panel weight <15 kg/m2	+	Door panel width >5000 <6000mm	selection:	25011-E 25251
Door panel weight <15 kg/m2	+	Door panel width >6000 <7500mm	selection:	25251

Fit a finger guard (25700) to each roller, except at cable break protection units.
Note the position of the roller with finger guard in the track! Parts marked 'A' should be positioned in the guide section of the track.

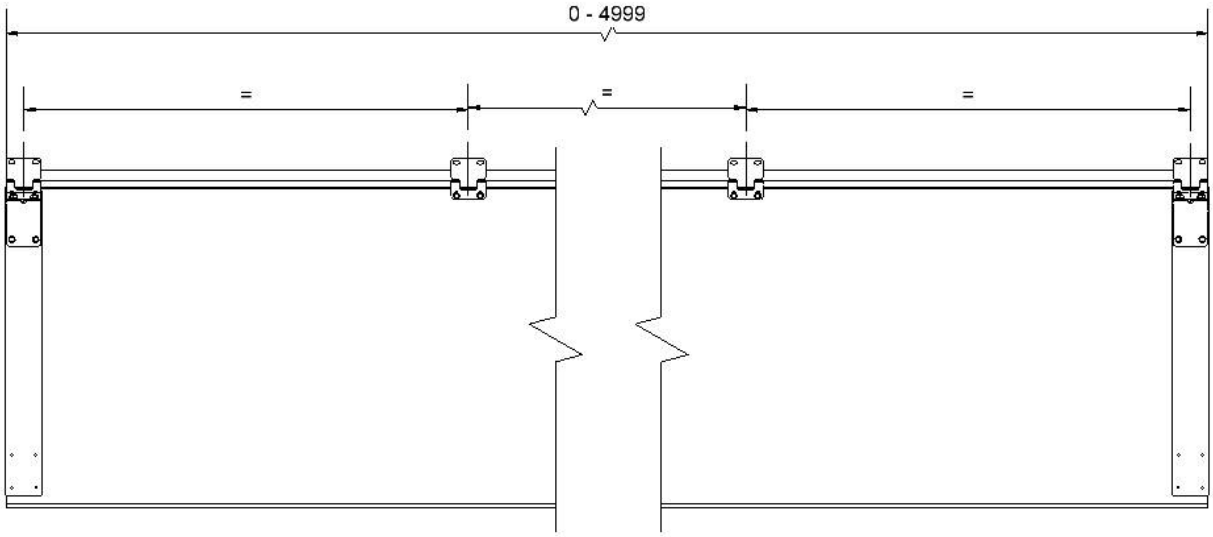


4.12.3 Panel assembly

In general, a door width of ≤ 4999 requires the use of single side hinges and end covers; you don't need to use stiffening profiles*.

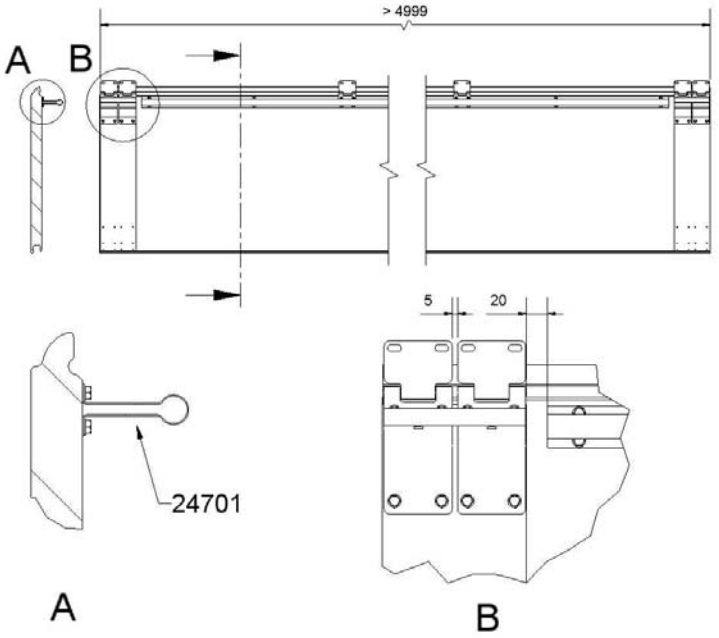
* Ask your panel manufacturer what the maximum panel width is before stiffening panels are required!

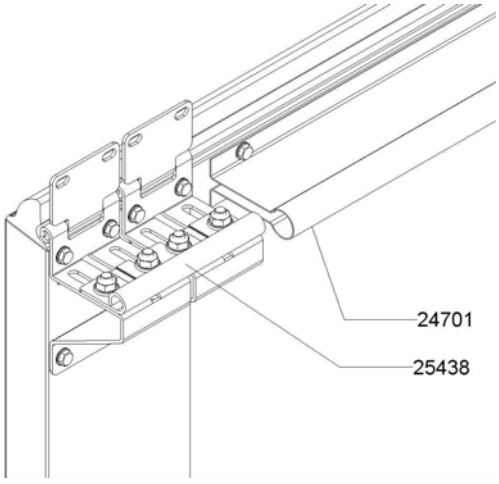
Panel assembly using 'single' side hinges up to doors <4999



Panel assembly using 'twin' side hinges >5000 - 7500

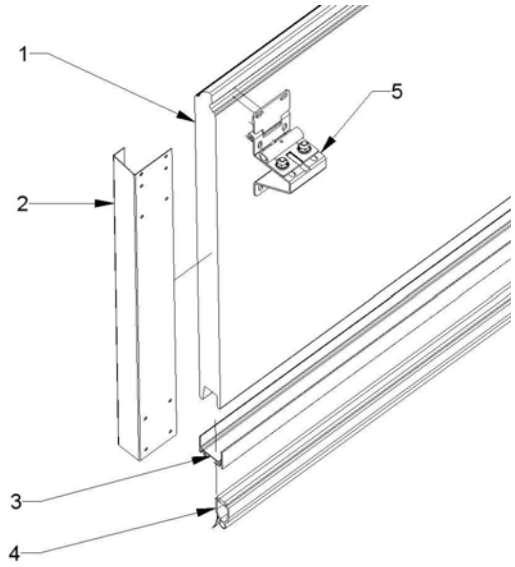
A door width ≥ 5000 requires fitting twin side hinges, adjusted (extended) end covers and reinforcing profiles on every intermediate panel!





4.12.4 Bottom section pre-assembly

Important: Never cut the bottom panel to adjust the overal door panel height, always cut the top panel! (see also appendix 4)



- Cut the panel (1) to the correct length.
- Fit the end covers (2) to the panel (1) using blind rivets.
- Slide the aluminium profile (3) onto the entire length of the panel (1) and secure using blind rivets.
  (Cut aluminium profile to size at end cover.)
- Slide the rubber seal type (see 4.16.3) (4) into the aluminium profile (3)

Rubber seal length = panel size – 30mm

- Now position the Fraba OSE-S. 1101 type optical sensors (transmitter + receiver) in the rubber seal.

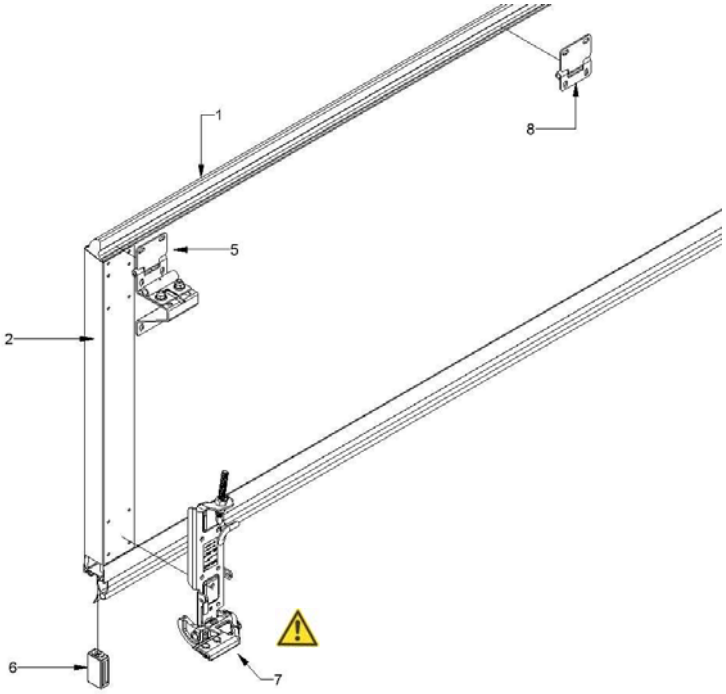
Connect these sensors according to the drive installation manual.

- Slide the OSE-D-B 55/8 (2st) type end stop (6) into the aluminium profile (3) and secure it.
- Fit the cable break protection in accordance with:

*Spring break protection manual 25450 * or 25453 ***

** Cable break protection 25450:*
TUV certified up to 900 kg door weight.

*** Cable break protection 25453:*
TUV certified up to 900 kg door weight.



Always ensure the rotation module with blade rotates freely at all times!

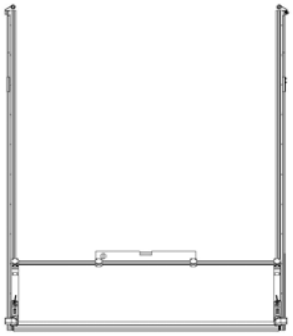
- Fit the side hinges (5) and the centre hinges (8), divide the centre hinges (8) over the length of the panel. See 4.11.1 for the correct number of centre hinges.

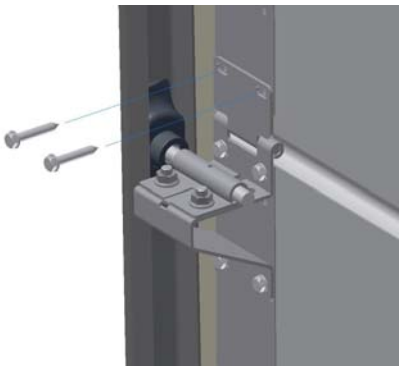
4.12.5 Intermediate section pre-assembly

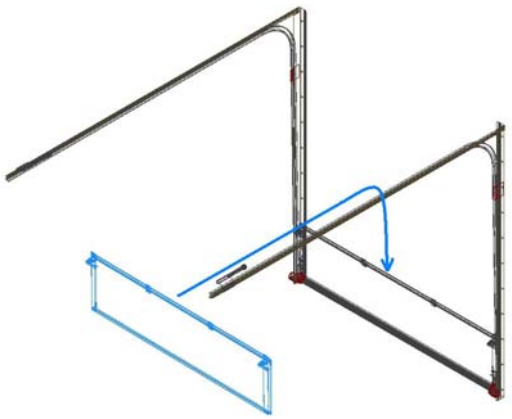
- Cut the panels to the correct length.
- Fit the end covers (2) to the panel (1) using blind rivets.
- Fit the side hinges (5) and the centre hinges (8), divide the centre hinges (8) over the length of the panel. See 4.11.1 for the correct number of centre hinges.

4.12.6 Positioning the bottom panel and intermediate sections

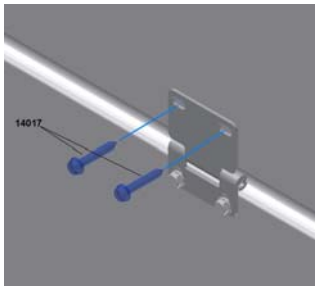
- Remove the cable break protection on one side.
- Position the roller without finger guard (25700) on the side of the cable break protection
- Position the bottom section between the L-angles.
- Now fit the cable break protection including roller to the other side, but without finger guard (25700)
- Make the bottom section level! *see figure on the right*
- Position the intermediate sections (2 –3 –4 etc.) on top of the bottom sections and join them together using the hinges. Adjust the rollers such that the nylon wheel runs in the curve of the track and that play between panel and side seal is minimal (24740). It should be possible to rotate the nylon roller wheel by hand. *See figure below right.*

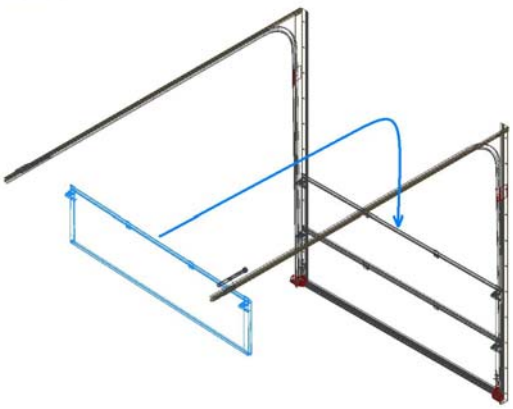






Pay attention to the installation of the finger guard!



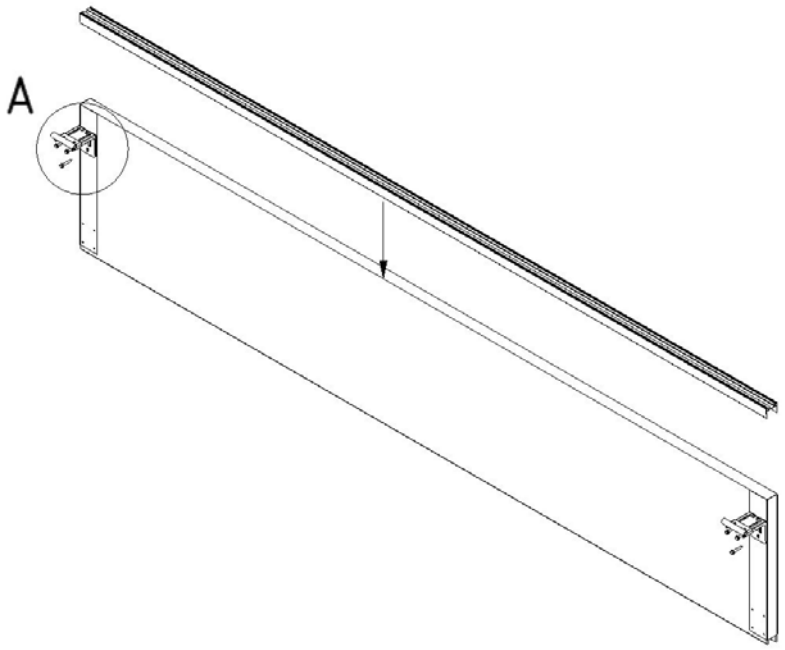


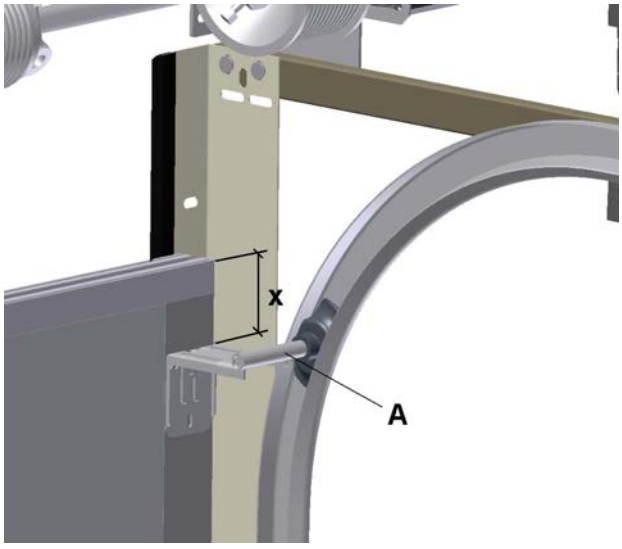
4.12.7 Positioning the top section

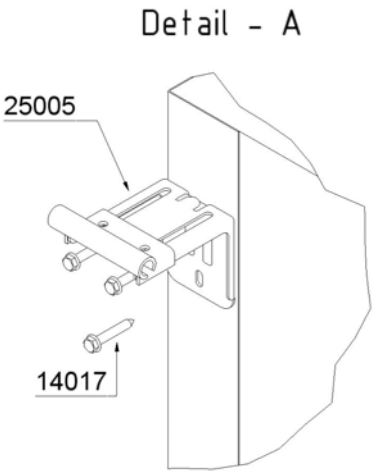
- Cut the top section to the correct height , see 4.11 for the correct height measurement.
- Slide the aluminium profile (3) onto the entire length of the panel (1) and secure using blind rivets.
- Position the top section onto the intermediate sections and install the top roll holder (25001 / 25005) in the correct position.

The correct position is determined by pressing the panel against the lintel seal. Now take the top roll holder with roller including finger guard and measure the distance X. Mark the positions for the Parker screws and secure. See figures (top roll holder 25005 shown).

- Adjust the top roll by pressing the panel against the lintel seal and securing the screws in the roll holder.







4.13 Fitting the cable and positioning the cable drum

General:

- Ensure the shaft is level.
- Guide the cable (see table) through the cable break protection and behind the roller shafts to the cable drum.
- Slide the cable end through the cable fixing hole of the cable drum and ensure the position of the right and the left cable drum is the same!
- When installing the cables, ensure the cable tension for the right and left cable is the same!

Item No. DOCO	Tensile strength	Diameter	Minimum break force	Max. door weight including 6 x safety
25110-	1770 N/m²	3mm	499 kg	166 kg max.
25111-	1770 N/m²	4mm	887 kg	295 kg max.
25112-	1770 N/m²	5mm	1390 kg	463 kg max.
25113-	1770 N/m²	6mm	2000 kg	666 kg max.

Determining the correct cable length:

Standard lift: Guide the cable through the cable break protection and behind the roller shafts to the cable drum, slide the cable end through the cable fixing hole and wind a minimum of 0.5 safety winding* onto the cable drum.

High lift : To determine the exact point (where the cable exits the drum when the sectional door is closed) at the high lift section (conical section) of the cable drum, follow the procedure below:

- Take a piece of rope of the exact 'high lift' length.
- Take the rope and start from the conical section at the bottom and begin winding it towards the top.
- Where the rope ends is the correct 'exit point' for the cable. Mark this point!
- Guide the cable through the cable break protection and behind the roller shafts to the cable drum, slide the cable end through the cable fixing hole and wind the cable up to the mark, allowing for a minimum of 0.5 safety winding* being left on the cable drum.

Vertical lift: To determine the exact point (where the cable exits the drum when the sectional door is closed) at the conical section of the cable drum, follow the procedure below:

- Take a piece of rope of a length that is equal to the door height.
- Take the rope and start from the conical section at the bottom and begin winding it towards the top.
- Where the rope ends is the correct 'exit point' for the cable. Mark this point!
- Guide the cable through the cable break protection and behind the roller shafts to the cable drum, slide the cable end through the cable fixing hole and wind the cable up to the mark, allowing for a minimum of 0.5 safety winding* being left on the cable drum.

** Equal to 2 windings **TUV approved** // Ref: TUV: BB-FTA-MUC/re-sc 30604_Besch_torque.doc*

!! THIS ONLY APPLIES TO DOCO INTERNATIONAL CABLE DRUMS !!

- Secure the cable by tightening bolt (blank).
- Then secure the cable drum including key onto the shaft by tightening the bolts (red). See 4.10.11
- Once again: Ensure the position of the left and right cable drum is the same and that the cable tension of both cables is equal!

4.14 Tensioning the spring set

Secure the door if necessary so it cannot rise, for instance by fitting clamps to the vertical guide tracks.
Tension the springs according to the procedure below.
The number of 'turns' for the spring is specified on the labels of the assembled spring.
After tensioning, secure the tensioning head to the shaft using 27 to max. 34Nm (this applies to both tensioning head 12002-W and tensioning head 12003-W).

Procedure for tensioning a spring.

IMPORTANT: Tensioned springs carry a high tension; always be very careful, especially when adjusting, and make sure the tensioning rods (12025) are the right size and are well maintained.

Tension the springs from bottom to top! Tensioning the spring will make it thinner and longer (the number of turns x wire thickness); if this is not the case, then the left and right springs have been swapped!

1) Mark the spring by drawing a straight line.
2) Insert the 1st tensioning rod into the tensioning head.
3) Turn the 1st tensioning rod a quarter turn in such a way as to tension the spring.
4) Hold the 1st tensioning rod secure and now position the 2nd tensioning rod in the next hole of the tensioning head.
5) Turn the 2nd tensioning rod a quarter turn.
6) Hold the 2nd tensioning rod secure (taking over the tension) and remove the 1st tensioning rod.
7) Repeat step 3 – 4 – 5 – 6 until the correct tension is reached.
8) Secure the tensioning head to the shaft by tightening both bolts in the tensioning head to 27 - 34Nm.
9) Now remove the last tensioning rod.
10) Now check the number of turns by counting the number of lines on the spring.

Remove the block on the shaft and vertical guide tracks and your sectional door is finished.
Ensure the door is properly balanced. If not, follow the instructions in 4.15 (correcting the spring tension).

4.15 Correcting the spring tension

Block the shaft and the door panel.
Secure the door if necessary so it cannot rise, for instance by fitting clamps to the vertical guide tracks.

IMPORTANT: Tensioned springs carry a high tension; always be very careful, especially when adjusting, and make use of the right size and well maintained tensioning rods (12025).

The maximum adjustment to the springs is 1 turn per spring. Ensure both springs are adjusted equally.

1) Insert the 1st tensioning rod in the tensioning head.
2) Turn the tensioning rod in the desired direction.
3) Carefully undo the bolts in the tensioning head and take over the spring tension.
4) Hold the 1st tensioning rod secure and now position the 2nd tensioning rod in the next hole of the tensioning head.
5) Turn the 2nd tensioning rod a quarter turn in the desired direction.
6) Hold the 2nd tensioning rod secure (taking over the tension) and remove the 1st tensioning rod.
7) Repeat step 4-5-6 until the desired tension is reached.
8) Secure the tensioning head to the shaft by tightening the bolts in the tensioning head to 27 - 34Nm max.
9) Now remove the last tensioning rod.

Remove the block on the shaft and vertical guide tracks and your sectional door is finished.

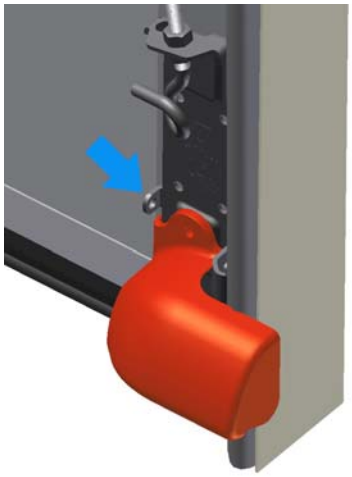
4.16 Operation

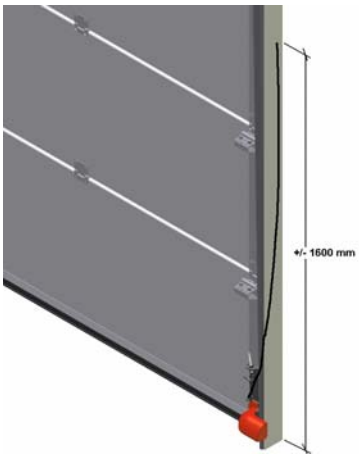
Your sectional gate may be operated using the following methods:

1) Rope operation / manual operation
2) Chain operation (1:4)
3) Electric drive (slip-on motor) and control
    a) Control: pulse operation
    b) Control: dead man operation
    c) Control: automatic or remote operation

4.16.1 Rope operation / manual operation

Attach the rope to the cable break protection and to a point approx. 1600mm from the bottom.
Rope length = door height – 1000mm.





4.16.2 Chain operating (1:4), item 25025

The hand chain hoist 25025 may not be used for doors heavier then 600kg (provided the sectional door is perfectly balanced!)
Maximum allowed pulling force: 16 kg.
Maximum allowed torque on the shaft: 39 N/mm²
The hand chain hoist 25025 comprises the following components:

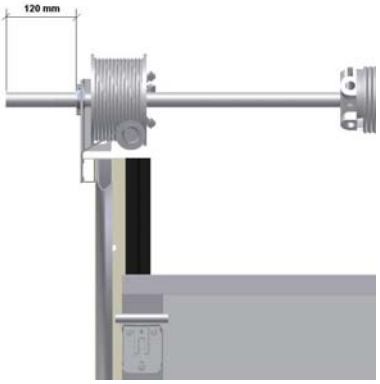
- Housing and transmission
- Hand chain approx. 8 metres long
- Key
- Mounting bracket
- Chain holder
- Adjusting rings 2x
- Fixing bolt

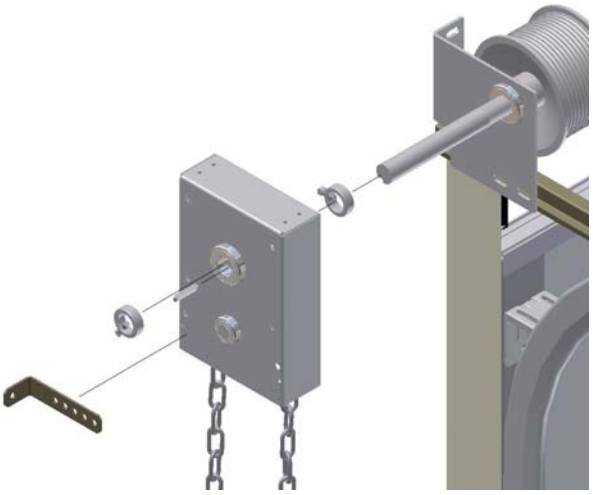
Fixing the hand chain hoist:

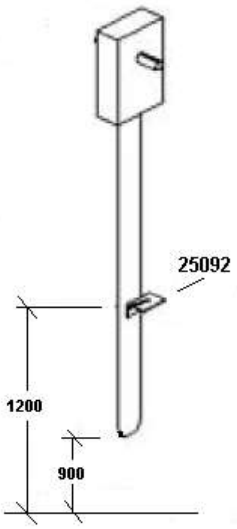
- Ensure the chain runs freely in its housing.
- Ensure the shaft protrudes approx. 120mm at the mounting side.
- Slide one adjusting ring onto the shaft.
- Slide the housing onto the shaft.
- Fit the mounting bracket to the housing and then to the wall or construction.
- Fit the key.
- Slide the other adjusting ring onto the shaft and secure both adjusting rings.
- Attach the chain holder to the wall or construction at a height of approx. 1200mm.
- Distance to bottom of chain approx. 900mm*.

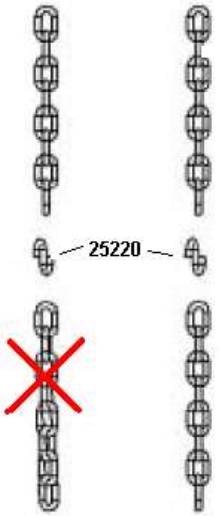
* If the chain is too short or too long, it should be lengthened or shortened. This is achieved by simply opening and closing a link.

Extra chain: DOCO item 25020-1
Link: DOCO item 25220









4.16.3 Electric drive (slip-on motor) and control

Our fitting sets have been certified for the drives specified in the table below, fitted with the specified bottom edge protection switch lists* in combination with GFA controls TS 961, TS 970, TS 980.
‚Fraba sensors OSE-S 1101 (transmitter and receiver) or Gelbau switch list.
**** In accordance with 'RWTÜV Gutachten Nr. 2674/04 vom 5.11.2004'***

The closing edge speed is determined by the cable drum and the number of windings of the drive.
For extended lift and vertical lift, the closing edge speed should be determined using table 1.

Drive	Speed (revs/min)	Speed (revs/sec)
GFA SE 9.15	15	0.25
GFA SE 9.20	20	0.33
GFA SE 9.24	24	0.4
GFA SE 9.30	30	0.5
GFA SE 14.21	21	0.35

Cable drum	Highest arm moment <HAM> (cm)	Cable drum circumference (cm)
Standard lift		
11014	5.3	33.3
11002	6.9	43.3
11003	10.5	65.9
Extended lift		
11005	depends on extended lift *	See table, appendix 1
11006	depends on extended lift *	See table, appendix 1
11007	depends on extended lift *	See table, appendix 1
11008	depends on extended lift *	See table, appendix 1
11004	depends on extended lift *	See table, appendix 1
	* see table, appendix 1	
Vertical lift		
11009	depends on extended lift *	See table, appendix 2
11010	depends on extended lift *	See table, appendix 2
11012	depends on extended lift *	See table, appendix 2
	* see table, appendix 2	

Thus the closing speed (S) becomes:

S= *cable drum circumference (cm) X speed (revs/sec)*

Example:
Drive: GFA SE 9.24 ⇨ *according to table at top of this page 0.25 revs/sec*
Door: 4000x4000 vertical lift
Drum 11010 ⇨ *according to table 2 at 400 cm: 72.8 cm circumference.*

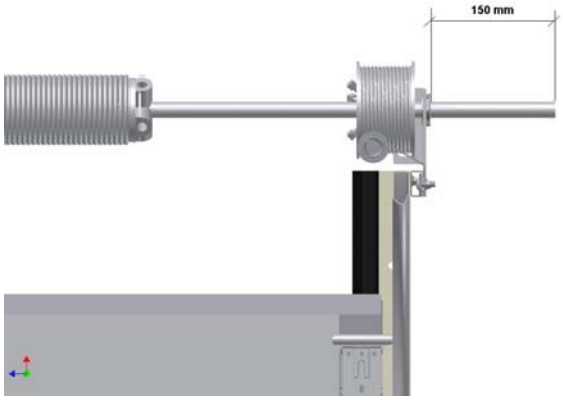
Closing speed: 72.8 cm x 0.25 revs/sec = 18.2 cm/sec.

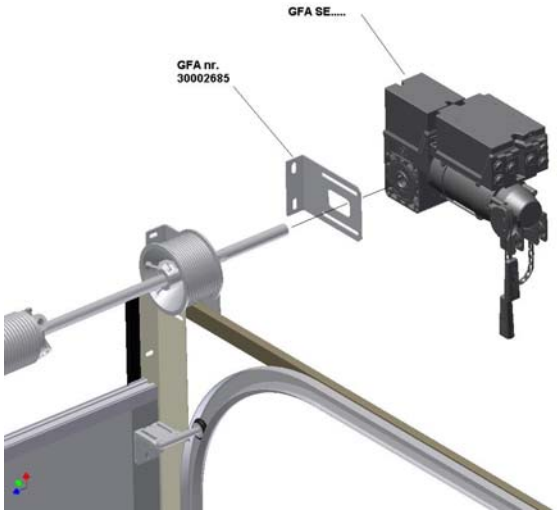
The table on the next page can now be used to check whether this closing speed complies with the certification. This is the case for our example; 5 types of closing edge protection have been certified for this application.

Drive Brand →	GFA			GFA			GFA			GFA			GFA		
Drive type →	SE 9.15			SE 9.20			SE 9.24			SE 9.30			SE 14.21		
Bottom edge protection	Closing speed (cm/sec)			Closing speed (cm/sec)			Closing speed (cm/sec)			Closing speed (cm/sec)			Closing speed (cm/sec)		
	9	18		12	24		15	29		18	36		12	25	
Gelbau 3100.0310	X	X		X	X		X	X		X			X	X	
Gelbau 3100.0804	X			X			X						X		
Gelbau 3100.0210	X	X		X	X		X	X		X			X	X	
Fraba OSE-P-204000	X	X		X			X			X			X		
Fraba OSE-P-204001	X														
Fraba OSE-P-257500	X	X		X			X			X			X		
Fraba OSE-P-257501	X	X		X	X		X	X		X			X	X	
Fraba OSE-P-259000	X	X		X	X		X	X		X	X		X	X	
DOCO 80045	X	X		X	X		X	X		X			X	X	

Installation of electric drive and control

The installation of the electric drive and control must be carried out in accordance with the installation manual provided by the supplier of the electric drive and control.
Ensure the shaft protrudes approx. 150mm at the electric drive side. Then fit the slip-on motor support plate and slide the slip-on motor onto the shaft and fit the key supplied.





4.16.3.a Control: Pulse control

This control performs one complete opening and closing movement of the door panel.
Always make sure you can see the door panel when using this control.

4.16.3.b Control: Dead man control

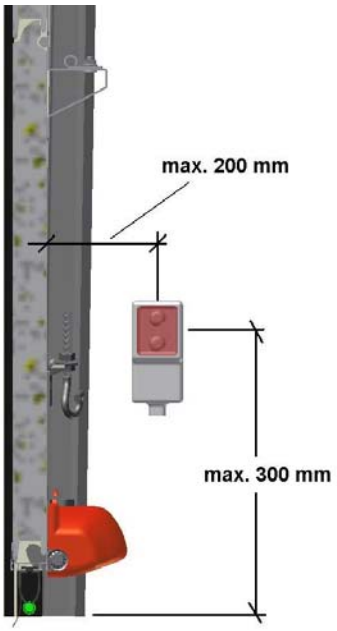
This control will only operate the door panel as long as the activating button is pressed.
As soon as the activating button is released, the door panel stops.

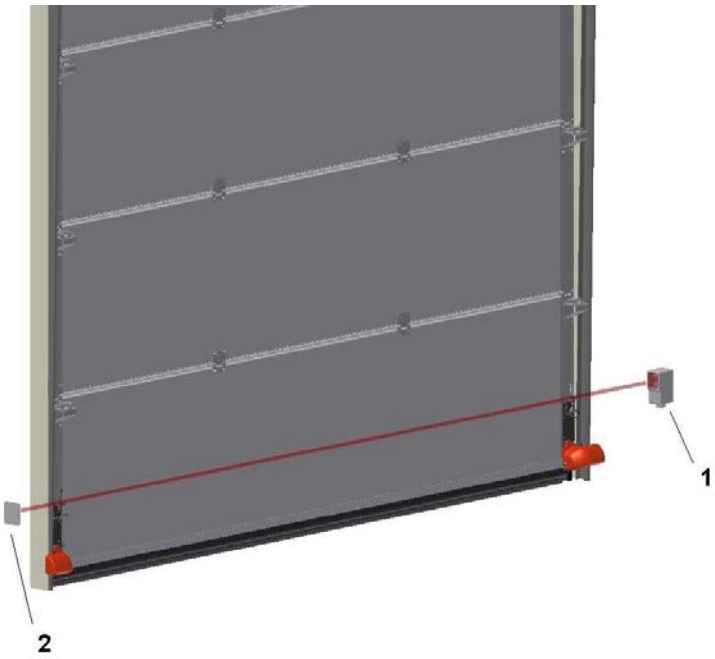
4.16.3.c Control: Automatic operation or via remote

This control can be used to operate the door panel without having the door panel in sight.
If the control is switched this way, or is changed to this mode later, an additional photoelectric cell needs to be installed. This photoelectric cell can be a reflection type or a one way photoelectric cell protection.
It should be positioned no more than 200mm from the door and no more than 300mm from the ground (inside).

Reflection type photoelectric cell shown:

1) GFA Item : 40005048 (photoelectric cell max. 7.5m range)
2) GFA Item : 40005241 (reflector)





4.17 Optional extras

Optional extras for installation:

- Windows
- Locks / bolts
- Handles

4.17.1 Windows

DOCO windows have been approved in accordance with the EN 12600 standard of the EU and comply with Class 2.

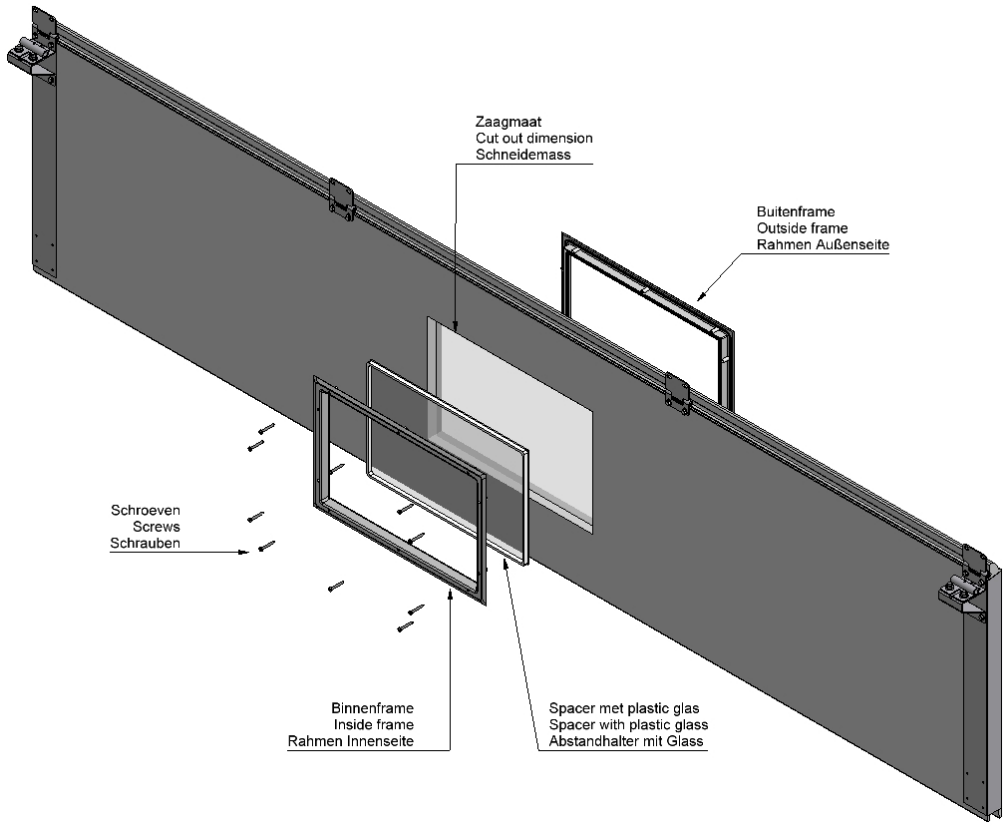
Approved windows:

- 85102 (PC) oval click-window, black window size: 725x325 cutting size: 695x295 R70
- 85600 (PC) oval screw window, black window size: 665x345 cutting size: 638x320 R100
- 85603 (PC) rectangular screw window, black window size: 637x332 cutting size: 610x305
- 85606 (PC) rectangular screw window, white window size: 488x322 cutting size: 466x300
- 85616 (PC) rectangular screw window, black window size: 488x322 cutting size: 466x300

Window installation:
Cut out the relevant cutting size as specified on the relevant window's data sheet using a jigsaw.
First position the window section to the outside using sealant, then position the spacer with plastic glass and finally position the inner frame.
Screw or click the window together.

NOTE:
Depending on the model, the window will either screw or click together, and the 'spacer' part may already be sealed to the outside frame.

Example: Window 85606



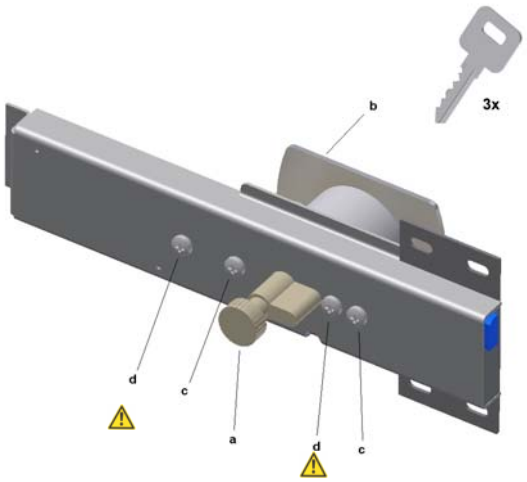
4.17.2 Locks and bolts

General
Electrically operated doors may not be fitted with locks or bolts!

4.17.2.1 Lock 25226 / 25228

Specifications:

- Lock 25226 with black outer plate
- Lock 25228 with chrome outer plate
- Stroke approx. 80mm
- Heavy-duty version, fitted to end cover.
- Euro cylinder
- 3 keys

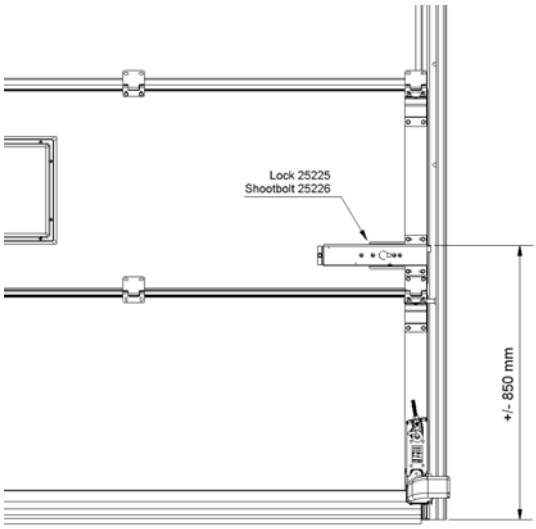


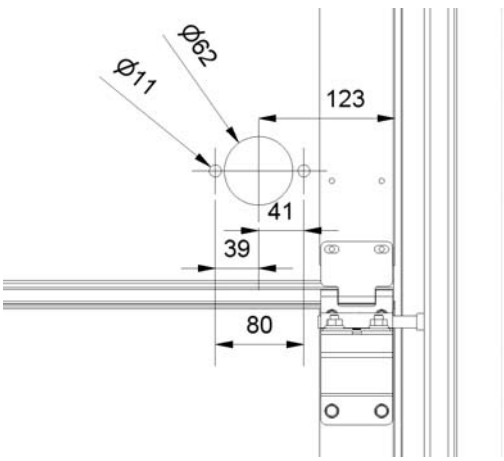
a) Euro cylinder
b) Outer plate
c) Screws to fix outer plate
d) Lock screws, don't undo!!

Installation:

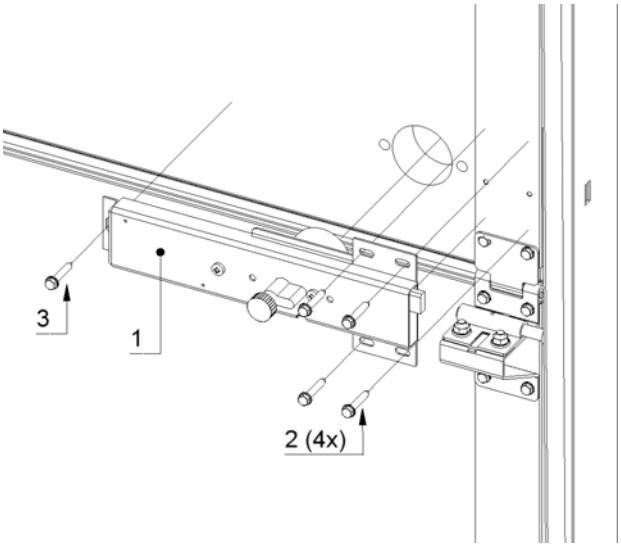
Screws coded D should NOT be undone!

1) Install the lock at approx. 850mm from the ground, just above the side hinge of the bottom section.
2) Using a jigsaw, cut a Ø 62mm hole in the panel and drill Ø11mm holes, as in drawing.

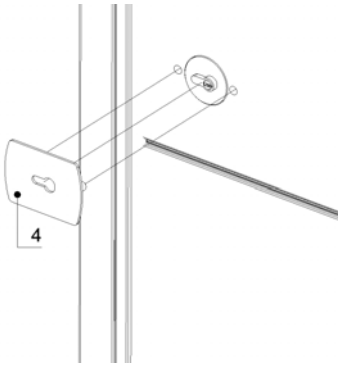


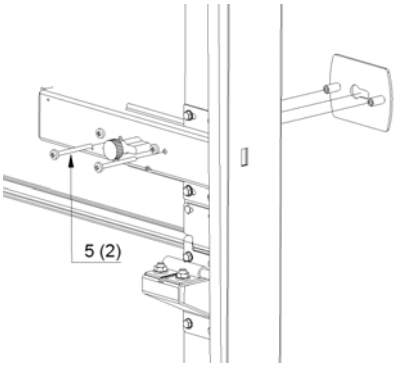


3) Place the lock (1) in the hole cut at 2 and mark the fixing points using a marker pen. Drill 4.5mm holes at these points.
4) Attach the lock to the end cover using the 4 x No. 2 Parker screws, to 15Nm. Then tighten the 1 x No. 3 Parker screw to 10Nm.

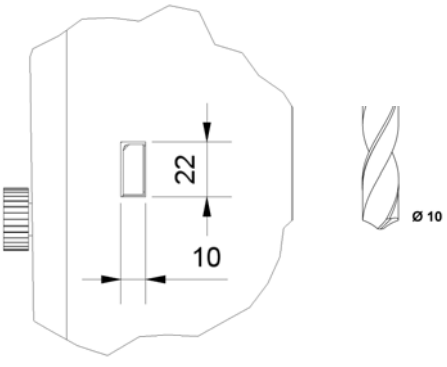


5) Fit the outer plate to the outside and secure the outer plate to the lock using the crosshead screws (5).





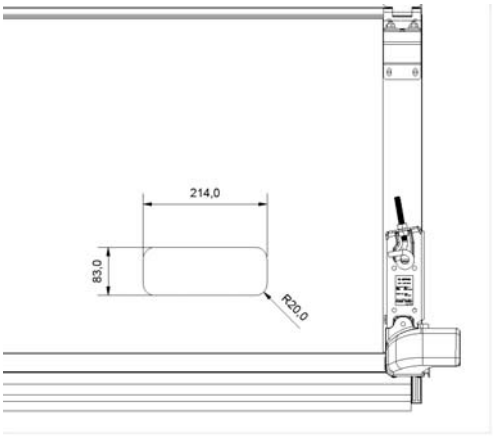
6) Next, drill two Ø10 holes in the L-angle with guide track and remove the remaining material using a file, as in the drawing.



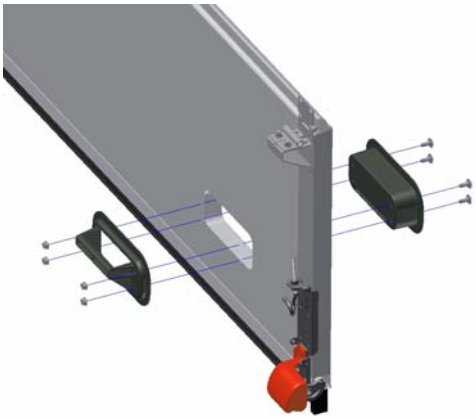
4.17.3 Handles

Handle 25093

1)



2)



3)

4)

5 Commissioning

This industrial gate should be commissioned by an experienced fitter. Commissioning must be recorded in writing. The person responsible for the installation should complete the certificate of conformity and affix the CE label. Affixing the CE label certifies compliance with EN directives.

Affix CE lable (item 80310 NL / FR) bottom left or right to an end cover of the 2nd section.

6 Troubleshooting

Check points for a defective / unbalanced sectional gate.

Applicable to all lift systems:

Check 1) Check the weight of the door panel.

Check 2) Have the correct cable drums been supplied?

Check 3) Are the cable drums fitted correctly?
Check the following (from inside to outside):
- Left drum coded red and fitted on the left.
- Right drum coded black and fitted on the right.
- Is the cable positioned in between construction/wall and shaft?
- Check the position of the cable going in.

Check 4) Check the correct torsion springs have been supplied and fitted.
- Check the wire thickness
- Check the spring diameter
- Check the spring length (excluding spring heads)

Check 5) When the door panel is closed, there should not be too much friction. The rollers should still turn.

Check 6) Are there any obstructions during opening / closing of the door panel?

Check 7) Check the clearance between door panel and guide track, it should be approx. 30mm and the cable should run freely.

Check 8) Are the guide tracks parallel in both vertical and horizontal direction? Measure distance and height.

Additional to high and vertical lift systems:

Check 9) Check the 'cable exit point' at the drum!
For high lift systems, this should be checked by tracing the course of the cable. As soon as the first roller goes round the bend, the cable should be at the flat section of the cable drum (also see 4.13).

7 Disassembly

CAUTION! DANGER!

- Disassembly should only be performed by qualified installation/disassembly personnel.
- Ensure only installation / disassembly personnel is present at the disassembly area and keep others away, if necessary by using appropriate safety devices.
- Ensure no electric components are live.
- Ensure adequate light when disassembling.
- Especially when releasing the springs, ensure the use of correct tools and stable footing.
- For details and drawings of the various parts to be dismantled, please refer to the installation instructions in this manual.

Procedure:

Step 1) Release the torsion springs!

IMPORTANT: Tensioned springs carry a high tension; always be very careful, and use the right size and well maintained tensioning rods (12025).

1) Insert the 1st tensioning rod into the tensioning head
2) Keep a good grip on the 1st tensioning rod and carefully undo the bolts on the tensioning head and transfer the spring tension.
3) Now place the 2nd tensioning rod in the next hole of the tensioning head and carefully release the spring. The spring is released from top to bottom.
4) Again, fit the 1st tensioning rod to the tensioning head and release.
5) Repeat steps 3-4 until the spring is released.
6) Repeat steps 1-4 for the other spring (springs).

Step 2) Remove the drive, following the drive supplier's instructions.

Step 3) Undo the bolts in the cable drums and remove the steel cables from the cable drums. Be careful for any residual tension in the cables, check the cables are slack!

Step 4) Remove the power-unit. Do this by first removing the coupling and then carefully sliding both shaft halves out of the bearing plates. Be aware that components may slide along the shaft!

Step 5) Remove the panel sections from top to bottom. Achieve this by removing the roller holders and centre hinges.

Step 6) Remove the horizontal section of the track set, including the ceiling brackets.

Step 7) Remove the vertical track set section.

7.1 Disposal

All parts of this industrial gate can be easily identified and recycled.
Separate the parts after dismantling.
Note: Materials can only be recycled if they are returned separately.
Deliver the materials to the relevant body responsible for processing the separated materials.

Appendix 1 High lift cable drums

11005 M102-1375 HL			11006 M134-1375 HL			11007 M146-3050HL			11008 M203-3050HL			11004 M162-4165HL		
Extended lift (cm)	HMA (cm)	Circum-ference (cm)	Extended lift (cm)	HMA (cm)m)	Circum-ference (cm)	Extended lift (cm)	HMA (cm)	Circum-ference (cm)	Extended lift (cm)	HMA (cm)	Circum-ference (cm)	Extended lift (cm)	HMA (cm)	Circum-ference (cm)
0	5.3	33.3	0	6.9	43.3	0	7.6	47.7	0	10.5	65.9	0	8.4	52.8
7.5	5.4	33.9	7.5	7.1	44.6	7.5	7.7	48.4	7.5	10.6	66.6	7.5	8.5	53.4
15	5.5	34.5	15	7.2	45.2	15	7.8	49.0	15	10.6	66.6	15	8.6	54.0
22.5	5.6	35.2	22.5	7.3	45.8	22.5	7.9	49.6	22.5	10.7	67.2	22.5	8.8	55.3
30	5.8	36.4	30	7.4	46.5	30	8	50.2	30	10.8	67.8	30	8.9	55.9
37.5	5.9	37.1	37.5	7.6	47.7	37.5	8.2	51.5	37.5	10.9	68.5	37.5	9	56.5
45	6	37.7	45	7.7	48.4	45	8.3	52.1	45	11	69.1	45	9.1	57.1
52.5	6.1	38.3	52.5	7.8	49.0	52.5	8.4	52.8	52.5	11.1	69.7	52.5	9.2	57.8
600	6.2	38.9	600	7.9	49.6	600	8.5	53.4	600	11.2	70.3	600	9.3	58.4
67.5	6.3	39.6	67.5	8.1	50.9	67.5	8.6	54.0	67.5	11.2	70.3	67.5	9.5	59.7
75	6.4	40.2	75	8.2	51.5	75	8.7	54.6	75	11.3	71.0	75	9.6	60.3
82.5	6.5	40.8	82.5	8.3	52.1	82.5	8.8	55.3	82.5	11.4	71.6	82.5	9.7	60.9
90	6.6	41.4	90	8.4	52.8	90	8.9	55.9	90	11.5	72.2	90	9.8	61.5
97.5	6.7	42.1	97.5	8.5	53.4	97.5	9	56.5	97.5	11.6	72.8	97.5	9.9	62.2
105	6.8	42.7	105	8.6	54.0	105	9.1	57.1	105	11.7	73.5	105	10	62.8
112.5	6.9	43.3	112.5	8.7	54.6	112.5	9.2	57.8	112.5	11.7	73.5	112.5	10.1	63.4
120	7	44.0	120	8.8	55.3	120	9.3	58.4	120	11.8	74.1	120	10.2	64.1
127.5	7.1	44.6	127.5	8.9	55.9	127.5	9.4	59.0	127.5	11.9	74.7	127.5	10.3	64.7
135	7.2	45.2	135	9.1	57.1	135	9.5	59.7	135	12	75.4	135	10.4	65.3
137.5	7.2	45.2	137.5	9.1	57.1	142.5	9.6	60.3	142.5	12.1	76.0	142.5	10.5	65.9
						150	9.7	60.9	150	12.1	76.0	150	10.6	66.6
						157.5	9.8	61.5	157.5	12.2	76.6	157.5	10.7	67.2
						165	9.9	62.2	165	12.3	77.2	165	10.8	67.8
						172.5	10	62.8	172.5	12.4	77.9	172.5	10.9	68.5
						180	10.1	63.4	180	12.4	77.9	180	11	69.1
						187.5	10.2	64.1	187.5	12.5	78.5	187.5	11.1	69.7
						195	10.3	64.7	195	12.6	79.1	195	11.2	70.3
						202.5	10.4	65.3	202.5	12.7	79.8	202.5	11.3	71.0
						210	10.5	65.9	210	12.7	79.8	210	11.4	71.6
						217.5	10.6	66.6	217.5	12.8	80.4	217.5	11.5	72.2
						225	10.7	67.2	225	12.9	81.0	225	11.5	72.2
						232.5	10.8	67.8	232.5	13	81.6	232.5	11.6	72.8
						240	10.8	67.8	240	13	81.6	240	11.7	73.5
						247.5	10.9	68.5	247.5	13.1	82.3	247.5	11.8	74.1
						255	11	69.1	255	13.2	82.9	255	11.9	74.7
						262.5	11.1	69.7	262.5	13.3	83.5	262.5	12	75.4
						270	11.2	70.3	270	13.3	83.5	270	12.1	76.0
						277.5	11.3	71.0	277.5	13.4	84.2	277.5	12.2	76.6
						285	11.4	71.6	285	13.5	84.8	285	12.2	76.6
						292.5	11.4	71.6	292.5	13.5	84.8	292.5	12.3	77.2
						300	11.5	72.2	300	13.6	85.4	300	12.4	77.9
						305	11.6	72.8	305	13.7	86.0	307.5	12.5	78.5
												315	12.6	79.1
												322.5	12.7	79.8
												330	12.7	79.8
												337.5	12.8	80.4
												345	12.9	81.0
												352.5	13	81.6
												360	13.1	82.3
												367.5	13.2	82.9
												375	13.2	82.9
												382.5	13.3	83.5
												390	13.4	84.2
												397.5	13.5	84.8
												405	12.5	78.5
												412.5	13.6	85.4
												415	13.6	85.4

Appendix 2 Vertical lift cable drums

11009 M216-3350 VLVL		
Door height (cm)	HMA (cm)	Circum-ference (cm)
180	8,1	50,9
187,5	8,2	51,5
195	8,4	52,8
202,5	8,5	53,4
210	8,6	54,0
217,5	8,8	55,3
225	8,9	55,9
232,5	9	56,5
240	9,2	57,8
247,5	9,3	58,4
255	9,4	59,0
262,5	9,5	59,7
270	9,6	60,3
277,5	9,8	61,5
285	9,9	62,2
292,5	10	62,8
300	10,1	63,4
307,5	10,2	64,1
315	10,3	64,7
322,5	10,4	65,3
330	10,5	65,9

11010 M280-5500 VLVL		
Door height (cm)	HMA (cm)	Circum-ference (cm)
330	10,6	66,6
337,5	10,7	67,2
345	10,8	67,8
352,5	10,9	68,5
360	11	69,1
367,5	11,1	69,7
375	11,2	70,3
382,5	11,3	71,0
390	11,4	71,6
397,5	11,5	72,2
405	11,6	72,8
412,5	11,7	73,5
420	11,8	74,1
427,5	11,9	74,7
435	12	75,4
442,5	12,1	76,0
450	12,2	76,6
457,5	12,3	77,2
465	12,4	77,9
472,5	12,4	77,9
480	12,5	78,5
487,5	12,6	79,1
495	12,7	79,8
502,5	12,8	80,4
510	12,9	81,0
517,5	13	81,6
525	13,1	82,3
532,5	13,2	82,9
540	13,2	82,9
547,5	13,3	83,5
555	13,4	84,2

11012 M340-8500 VLVL		
Extended lift (cm)	HMA (cm)	Circum-ference (cm)
555	13,5	84,8
562,5	13,5	84,8
570	13,6	85,4
577,5	13,7	86,0
585	13,8	86,7
592,5	13,8	86,7
600	13,9	87,3
607,5	14	87,9
615	14,1	88,5
622,5	14,2	89,2
630	14,3	89,8
637,5	14,3	89,8
645	14,4	90,4
652,5	14,5	91,1
660	14,6	91,7
667,5	14,6	91,7
675	14,7	92,3
682,5	14,8	92,9
690	14,9	93,6
697,5	15	94,2
705	15	94,2
712,5	15,1	94,8
720	15,2	95,5
727,5	15,3	96,1
735	15,3	96,1
742,5	15,4	96,7
750	15,5	97,3
757,5	15,5	97,3
765	15,6	98,0
772,5	15,6	98,0
780	15,7	98,6
787,5	15,8	99,2
795	15,8	99,2
802,5	16	100,5
810	16,1	101,1
817,5	16,1	101,1
825	16,2	101,7
832,5	16,3	102,4
840	16,3	102,4

Appendix 3 Fixing vertical track sets

Number of fixing points	Force (KN) 5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35
8	M8	M8	M8	M10	M10								
10	M6	M8	M8	M8	M10	M10	M10						
12	M6	M6	M8	M8	M8	M10	M10	M10					
14	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10			
16		M6	M6	M8	M8	M8	M8	M10	M10	M10	M10	M10	
18			M6	M6	M8	M8	M8	M8	M10	M10	M10	M10	M10

Appendix 4 Hardware / Panels.

Panel type (1)	End cap (2)	Alu. Profile (3) Top and bottom	Bottom seal (4)	Side hinge (5)	Intermediate hinge (6)
Bremet Securwall	**80612L** (610) / **80617L** (488)	**80041**	**80045**	**25734**	**25733**
Hoesch	**80612L** (610) / **80613L** (488)	**80041**	**80045**	**25334**	**25333**
Tekla Teckentrup	**118438 / 118449**		**80045**		
Apco - Kingspann	**80612L** (610) / **80617L** (488)	**80041**	**80045**	**25334**	**25333**
Ryterna	**80612L** (610) / **80617L** (488)	**80041**	**80045**	**25634**	**25633**

Appendix 5

EC MANUFACTURER DECLARATION / EC DECLARATION OF CONFORMITY

We hereby declare that the products described below conform to the relevant fundamental requirements of the applicable EU directives, both in its basic design and construction as well as in the version marketed by us (Inspection bodies: TÜV Nord Cert 0032 and SP 0402). This declaration will cease to be valid if any modifications are made to this product without our express approval or if a door operator or panel other than those indicated below or other products than those described by Doco-International are used.

Product Description

Manually or electrically driven sectional overhead door DOCO SL/HL/VL

Panels in finger-safe execution:
ThyssenKrupp Hoesch, Ryterna, Bremet, Apco/Kingspan, Tekla/Teckentrupp

Motors:
GfA SE series

Closing edge safety device
Various Fraba and Gelbau models, all of them in accordance with RWTÜV Certification no. 2674/04.

Manufacturer:

Doco-International BV
Nusterweg 96
NL-6136 KV SITTARD (NL)
Tel. +31-46-4200666
Fax. +31-46-4526894

Relevant EU Directives applied:

- Machinery Directive 98/37/EC
- Construction Products Directive 89/106/EEC
- EMC Directive 89/336/EEC
- Low voltage Directive 73/23/EEC

Harmonised Standards applied:

- EN 13241-1 Doors - Product Standard, Part 1
- EN 12604 Doors - Mechanical aspects
- EN 12453 Safety in use of power operated doors - Requirements
- EN 12635 Doors - Installation and use
- EN 12978 Doors and gates - Safety devices